

TOSTEM

PRE-ENGINEERED WINDOWS

PART OF **LIXIL**

LIXIL

Link to Good Living

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JAPANESE INNOVATION FOR
LARGE HOUSING PROJECTS

ABOUT LIXIL

Every person on the planet dreams of a better home. LIXIL makes that possible with pioneering housing and water products.

A better home is made up of surprisingly simple things – doors and windows that connect you with the world outside; baths to escape in after a long day; kitchens that unleash creativity; toilets that provide cleanliness and comfort; showers and faucets to experience water in new ways; interiors and exteriors that bring spaces to life.

LIXIL makes better homes a reality for everyone, everywhere.

Drawing on our Japanese heritage, we create and innovate using world-leading technologies to make high quality products that solve everyday, real life challenges.



But the LIXIL difference isn't what we do, it's the way we do it:

Meaningful design. We innovate because we should, not because we can.

Entrepreneurial spirit. Working with partners, experimenting often, and learning fast from failures to move with speed.

Access to all. Adapting existing technologies to meet universal consumer needs.

Responsible business growth. Impacting global issues like sanitation, water conservation and environmental sustainability.

We are proud that our products touch the lives of more than a billion people every day, but there is potential to do so much more.

Being path pavers in consumer centricity uncovers opportunities for real differentiation enabling us to find a unique, clutter breaking proposition. Our deep understanding of our consumers' lives drive us to create truly differentiated products, services and business models. As we continue to expand across Asia Pacific, our endeavor is to reach beyond our current channels and capabilities, to understand existing and undiscovered needs and become relevant to even more people. We will learn, experiment and continue to create solutions for better living spaces for today and tomorrow.

The real work starts now...

LIXIL Link to Good Living

LIXIL

GROHE

American Standard

INAX

TOSTEM

DXV



ALL SOLUTIONS COME FROM GEMBA!



What is Gemba?

Gemba is the 'workplace' where value is created. The construction site is 'Gemba' for the real estate industry. Gemba involves a deep study of existing processes to reduce wastage and brings greater efficiency through innovative design of products and processes, which are lean and address every day problems.



TOSTEM Approach to Solution finding!

Fixing windows at the construction site often poses the highest challenge. Non-value added work or rework make installations more complex, slow and destroys product quality. TOSTEM believes that the onus must not lie solely on the developer; the window company must also simplify design of the product so that even with existing site conditions - work speed and quality is not sacrificed. It is this approach by TOSTEM that has led to development of pre-engineered range of window products. Increase in share of work done at factory, reduces risk of delays at site.



Why Large Projects in India Have Unique Needs?

India is home to 1.3 billion people and a rising middle class. Project size in India for residential construction is much larger than in other countries. Building height has also greatly increased without a corresponding increase in construction time. Developers are increasingly employing faster methods of construction and thus, ready to fit products are becoming the norm. A high-rise township project with 24 towers for instance will require far better suppliers and vendors. Requirements of speed, quality and reliability are of higher order than in the older era of stand alone residential tower blocks.

LEARNINGS FROM GEMBA!



One Vendor is Fewer Risks, Greater Reliability!

Many problems start with limited vendor capability to handle large jobs. Consequently, the work is divided into many vendors. This multiplies complexity, as the project team has to contend with different supply speed and different standards of quality. One vendor capable of handling the full job is a better solution, as the supervision load is much reduced and quality consistency can be achieved. TOSTEM offers this option to a developer for the very first time.



Last Mile Quality is of Great Importance!

The importance of Windows in providing real comfort to the flat buyer is steadily increasing. Windows also serve a great functional purpose - be it for sound or water isolation or the safety of the house & its inhabitants. Windows also have a great impact on the façade and looks of the interiors

Quality of Windows has to be seen from the perspective of both the occupant and the developer. TOSTEM believes that the two are the same and can be achieved only through a 360° approach starting with design, to extrusion, fabrication and installation. Each step is equally important in this quality journey.

Total quality = Sum of 'design + manufacturing + Installation + process quality'



Speed of Window Installation Can Impact OC!

Occupancy certificate is a key milestone for the developer, in which windows play an important role. Given that windows have to be installed as per site progress, quick installation speed, less shortage and less rework is really important to achieve building completion.

Many developers define a narrow 'window stage' within which windows have to be installed and to close the perimeter of the building. This greatly increases pressure on window supplier, as the time allowed to complete installation is greatly reduced. True success lies in achieving both quality and speed, without sacrificing correct installation practices.



Lean Design & Higher Functionality!

Windows are structural elements. Wind load criterion has to be always met, but the design has to be efficient, not unduly heavy. In window design, great importance is given to functionality i.e. ability to stop water, air ingress, dust and noise. This is of even greater importance in high-rise buildings where the air movement is higher than at ground level. This is very well defined under JIS and ASTM standards.



Lean Cost & Lower Maintenance!

Lean cost comes from lean design. Lean design must also comply with both safety standards and highest levels of functional requirements.

Since developers have responsibility to maintain a building for 5 years under RERA rules, low maintenance of products is becoming very important.



NEXT EVOLUTION IN WINDOW DESIGN!

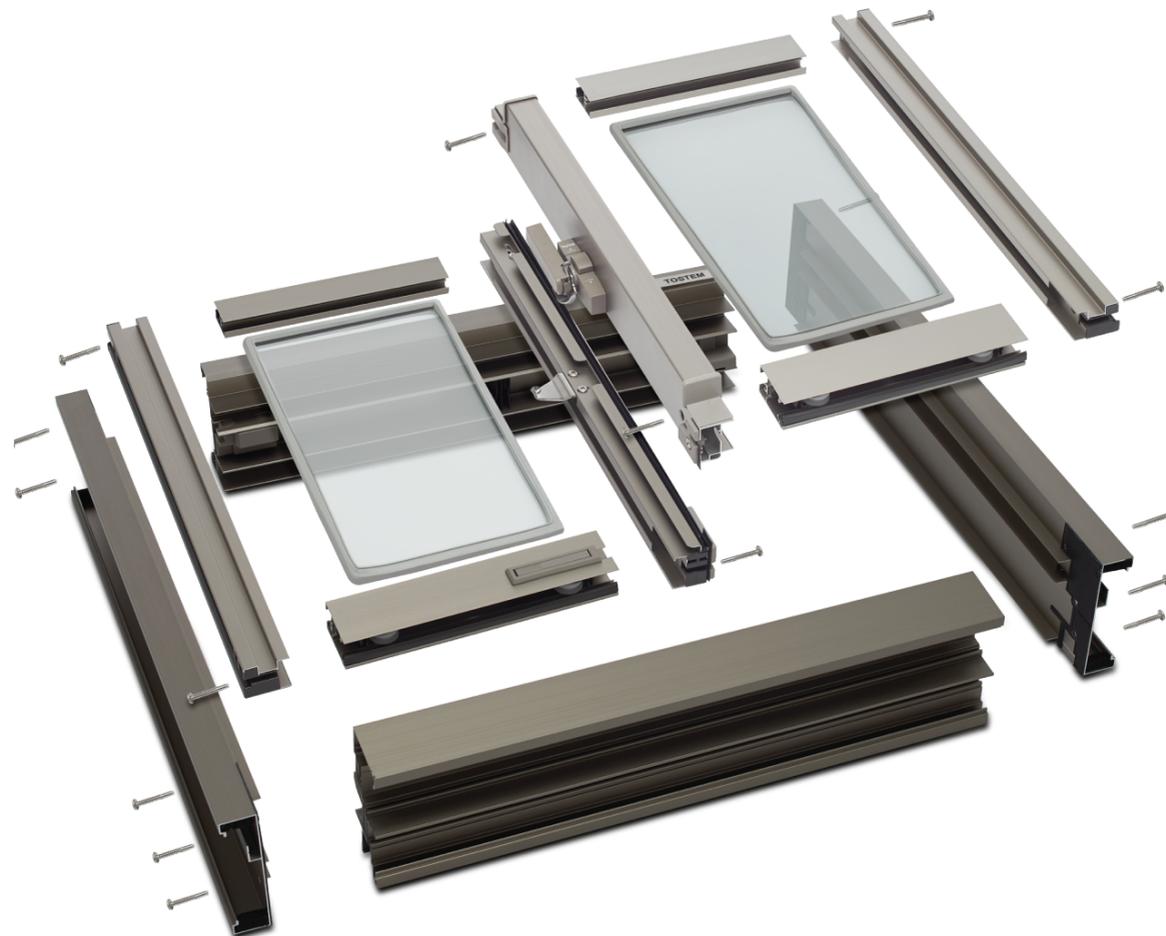


Why Pre-engineered Windows is Such a Powerful Idea!

The traditional method of manufacturing uses very little mechanization and follows the batch production process. Fabrication & assembly is done partly at factory and partly at site. The entire process is slow and quality is very much dependent on worker skill at installation stage.

TOSTEM follows a process similar to pre-engineered buildings, entire window fabrication is done at factory and only the assembly is done at site in a quick burst of speed. To explain further:

- The manufacturing process is mass production oriented.
- Entire window is manufactured at factory, except glazing and assembly.
- Manufacturing accuracy is so good that there is no mismatch during installation.
- Hardware is fixed at factory; site work is very minimal.
- Entire window is packed in 2 separate boxes for sash and frame.
- Supplies are made from any of the TOSTEM factory at Bangkok, Vietnam or at Shanghai.



Design Performance & Actual Performance is Same!

Since the entire window is manufactured at factory, there is no deviation from design performance. The test results can be observed on windows installed at site.



Control Till End Stage, Site Work Becomes Low Skill!

Work at site usually poses more problems, due to worker skill levels and difficulty in exercising process control. The better solution followed by TOSTEM is to:

- Reduce work content on site.
- Simplify work so that it can be done by less skilled or unskilled workers (TOSTEM assembly requires only one tool – screwdriver).
- Use visual instructions so that training requirements are reduced.



No Fabricator Dependence!

TOSTEM is a window manufacturer and not merely a fabricator or system supplier. The entire accountability for timely supplies and quality of product is with TOSTEM.

TOSTEM works with trained installers who would undertake glazing, assembly and installation of windows. TOSTEM will always ensure that the project is completed within the time period promised.



Customer Benefits Over Current Solutions!

- Since the window is entirely manufactured in-house, there will be no shortages or rework at site which can delay site progress.
- Quality is always consistent.
- Perfectly suited to meet high volume requirements of very large projects.





JAPANESE ENGINEERING & TOSTEM QUALITY!



Traditional Batch Vs. TOSTEM Mass Manufacturing!

The traditional method of window manufacturing follows a batch process. General purpose machines are used and chances of mistakes are higher as the process is more man-dependent. Production speeds are also quite low.

The TOSTEM method of manufacturing uses dedicated machines (punch & die set) for every operation. Process control is better and output rates are much higher. It is also easier to exercise quality control as there is a dedicated cell for each design of window.



High Precision Process!

The punch system of manufacturing followed by TOSTEM is very accurate. Anodizing finish is preferred as it has a uniform thickness of 20 microns. Powder coating is also used, but is more difficult in production, as thickness usually varies between 60-120 microns.

Since manufacturing tolerances are so close - manufacturing accuracy and flatness is also very high, which makes for great ease during glazing and assembly.



Life Cycle Testing in Accredited Test Lab!

The test lab at Japan is accredited by the Japanese Government. The factory at Thailand has the largest testing facility for wind pressure, air tightness, water tightness, material composition, sound isolation, thermal insulation, light & UV resistance, profile and anodizing life test against both JIS and ASTM Standards. Rollers are tested for 200,000 operations which is many times more than lifetime use of product.



Ease of Operation!

Windows are intended to be opened and closed many times in a day. A key aspect of design is that effort should be minimal so that even a child can safely open the window. For instance, the effort required to open or close a 2-tract / 4-panel WE Plus Door of 4200 mm width and 2400 mm height with single glass is under 50 N (5 Kgs). The effort is so less that it does not require any mechanical assistance or automation.



Ease of Storage & Transportation!

The sash and frame are packed in separate boxes. Gaskets are supplied in roll form. The entire bundle is very compact which reduces transportation cost and transit damages. Space required for storage at site is much less which reduces chances of theft. Lead and lift requirements are much simplified.



Sustainable Materials & Fire Safety

Aluminum is 100% recyclable and has higher resale value as compared to other window materials. It is also environment friendly, fire safe and does not release toxic fumes in event of fire. The life of aluminum windows is much longer.



BENEFITS OF TOSTEM DESIGN!



50 Years' Performance History in Cyclonic Weather at Japan!

TOSTEM is one of the first, large scale manufacturer of aluminum windows in the world. Since the climate at Japan is both cold and cyclonic - highest priority has been given to make windows safe against air and water ingress. Similar to India, the dominant style in Japan is Sliding Windows, which is different from Europe where Casement Tilt & Turn is more popular.



Greater Strength, Stronger Corners, Does Not Bend or Crack!

The TOSTEM window is very unique as the section thickness is higher in transverse direction to sustain higher wind load. Also, the thickness is higher at points of screw fixing. The aluminum alloy used is 6063 with T5 tempering which has more strength. The corner is joined at 90° and does not require cleats, which are less strong. The TOSTEM window is stronger and has a longer performance life as compared to other window materials.



Better Air & Water Sealing!

Japanese windows are designed for far better performance against air and water which is very important for comfortable living. This is achieved by:

- Rubber gaskets are used instead of wool-pile. This provides better sealing against dust, noise and water.
- Gaskets help in smooth operation of window and have a longer life.
- Precision nano-tech gaskets are used at frame corner joints to stop water ingress. It is not necessary to fill joints with silicon which is a common practice with traditional windows.
- Water entry is stopped through use of one-way drainage valve. Also the frame is designed to create a water-head between inside & outside. Using a common rule of thumb, wind pressure up to 10 times of water head can be sustained without entry of water inside.



Special Protective Coating, Higher Life & Luster!

With the patented TEXGUARD system, the colors of TOSTEM products will last at least 40 years. TEXGUARD is an additional clear synthetic resin paint deposited over the anodized surface which alters the molecular structure of the surface paint and protects the surface against light, heat and water.

High scratch resistance of 4H and low accumulation of natural dust makes it easy to clean windows with less effort and retain a new-like look for a long time.



Greater Safety with Crescent Lock

Crescent lock is more sturdy and far safer as compared to a push lock. It can only be locked in one position and it is easy for user to see if the lock is in place. A secondary lock stops crescent lock from inadvertently getting opened.

TOSTEM

PREMIUM WINDOW SOLUTIONS



WHY TOSTEM CAN BE TRUSTED!



Ingot to Fabricated Window!

TOSTEM, Thailand is an integrated complex dedicated to manufacture of Aluminum windows. Design of new products, casting of Alloy, Extrusion, Surface treatment, Coating, Fabrication is all carried out in-house. A second manufacturing complex with similar capabilities is at Vietnam. Window fabrication units are dispersed across many countries. Quality consistency is achieved by having end to end control over the entire manufacturing process.



TOSTEM, Thailand - is One of the Largest Window Factories in the World!

The facility at Bangkok, Thailand was set up in 1987 and is dedicated to supplying Pre-engineered Windows to Japan and other Asian countries.

The TOSTEM factory has Extrusion Capacity of 7,000 MT per month, an employee strength of approx. 7,500 and covered area of 591,332 Sq.M. The product range is very extensive and meets special requirements of different countries.



Unmatched Production Capacity!

The production capacity is approx. 50,000 windows per day in different SKU's. The larger share is anodized finish, which is highly preferred by customers. The hardware sourcing is in-house and supply chain is very reliable.



Quality Assurance!

TOSTEM is committed to developing the best products to meet customers' requirements. Detailed inspections are carried out during design and testing stages to assess criteria such as basic performance, durability, weather resistance and such. Only designs that pass strict quality control tests are made into products for delivery to customers.

HOW TOSTEM BEST MEETS DEVELOPER REQUIREMENTS!



Customer Preference for System Aluminum Windows!

System Windows are becoming highly popular in India due to longer life, greater reliability and quality assurance. Aluminum is also the dominant material for residential windows in neighboring countries like, Singapore, Thailand, Dubai and Middle East where the climatic conditions are similar. In these markets aluminum is seen as a premium window material.



Contemporary Designs & Slim Frames!

By its very nature, metal windows are both slim and strong. It is much easier to fix and operate hardware (metal to metal). Aluminum windows commonly do not require additional steel reinforcing, which is compulsory with other materials. The reinforcing can only be inserted in middle section leaving the corners very weak.

Recent developments in 'Aluminum Minimal Frames' distributes wind-load across the whole length of the frame. The frame in 'TOSTEM - GRANTS' can also be flushed, to product an attractive visage of glass. This system is very well suited for high rise buildings and offers a versatile range of design options.



Cost Effective, Japanese Products!

TOSTEM products are lean in design and lean in cost. This benefit comes from excellence of design, high volume manufacturing and cost control from ingot to fabricated window.

Japanese products like cars, have won confidence of customers in India for very high reliability, finish and performance. With TOSTEM, customers will enjoy similar benefits and will appreciate owning a Japanese product.



Brand Assurance & Brand Service!

LIXIL is a large conglomerate with brands like GROHE, American Standard, INAX in its portfolio. All products have a reputation for the highest quality of service. Continuity and peace of mind is assured with LIXIL.



Unique & Easy Installation Process!

pre-engineered window is supplied with 'bottom plates' which are fixed in plumb on the window jamb using spacers, over which the full window is snap fitted. The window is fixed on 3 sides using anchor fasteners and air-gaps are closed with silicon on outside & acrylic inside. The process is fast & easy. No other work is required at site.

There is a huge reduction in time required for installation since only the bottom plates is levelled using a spirit-level and use of water line is avoided. Also less manpower is required since only the bottom plate is to be levelled and not the entire window.

Assembly and installation can be done with minimum training. The process can easily be learnt. A developer can also use own team for installation.



Low Maintenance!

All surfaces and functional parts are designed to perform in tropical climate. A call center is available in case any service is required by the customer



Come & Visit!

Many customers visit the manufacturing facility and the LIXIL Crystal Product Display Center at Bangkok to get a closer feel of TOSTEM products and its manufacturing capabilities.

COLOR RANGE ANODIZED FINESSE



 Natural White



 Natural Silver



 Ivory White



 Shine Grey



 Autumn Brown



 Natural Black

TEXGUARD

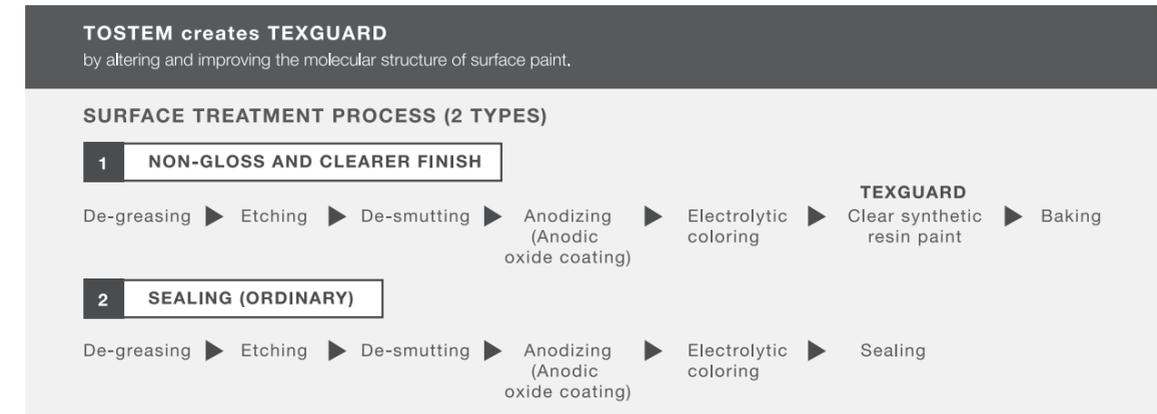
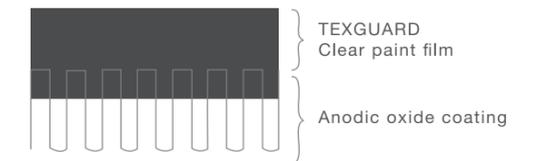
Surface treatment colour with advanced “TEXGUARD” technology

The Non – Gloss Finish and Clearer Finish feature combine anodic and organic coatings to provide an effective surface treatment that applies synthetic resin paint which is then baked over an anodic oxide coating.

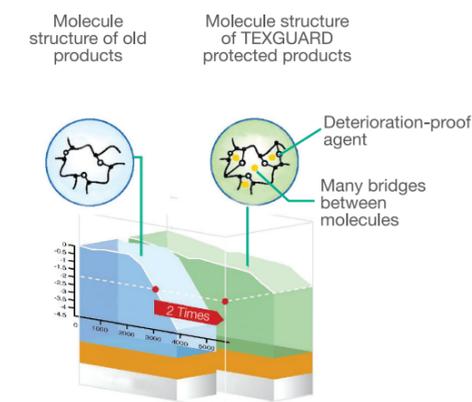
Our surface treatments are available in a wide range of color tones, from light to dark in the bronze color spectrum, and Natural White, Ivory White and Autumn Brown through the use of pigments. The final surface color retains its tone, resulting in a lasting and pleasing appearance.



FEATURE
Combined coating diagram

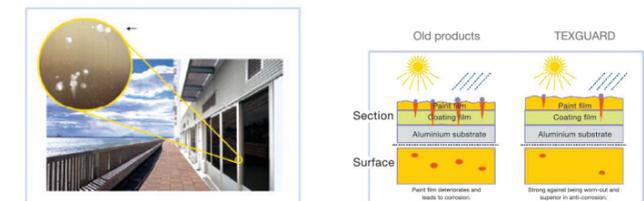


TEXGUARD STRUCTURE



TEXGUARD CHARACTERISTICS

- Aluminum frames corrode after time due to harsh environmental conditions.
- 1. Illustration demonstrating the effectiveness of TEXGUARD (Against light, heat, water, etc.)



DURABLE BEAUTY: With our patented **TEXGUARD** system, the colors of **TOSTEM** products last at least 40 years, with excellent scratch resistance that ensures the “**NEW**” look never fades. Additionally, natural dust and dirt accumulation-resistance keeps **TOSTEM** products looking clean with less effort.

Certification
JIS no. : H4100 No. TH9009, H8602 No. TH9010
ISO : ISO9001:2008, ISO14001:2004

WHY PERFORMANCE IS IMPORTANT TO US?

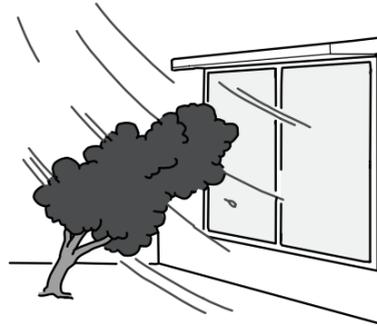
Wind loading resistance performance

WIND LOADING RESISTANCE PERFORMANCE indicates at what level windows and doors can bear the wind load.

THE PURPOSE is to ensure that selected windows can resist a level of wind load in area and height without any loss, cracking, or breakage.

WIND PRESSURE RESISTANCE
JIS (A4702-2000 and A4706-2000)

Class	Value corresponding to each class
	[Maximum pressure]
Higher ↑	S-7 (360) 3600 Pa
	S-6 (280) 2800 Pa
	S-5 (240) 2400 Pa
	S-4 (200) 2000 Pa
	S-3 (160) 1600 Pa
	S-2 (120) 1200 Pa
	S-1 (80) 800 Pa



WIND PRESSURE AND VELOCITY

Wind pressure	Wind velocity	Phenomenon
1800 Pa	60 m/s	Steel tower may fall down.
1250 Pa	50 m/s	Wooden houses will collapse.
800 Pa	40 m/s	Tiles will fly. Antennas will fall off.
450 Pa	30 m/s	Twigs will snap off. Cannot stand on your own.
200 Pa	20 m/s	Signboard will fall over. Cannot walk towards the wind.
50 Pa	10 m/s	Cannot use umbrella. Hard to walk toward the wind.

Reference:

"Makurazaki Typhoon" in Japan 1945, had a wind velocity of approx. 51.3 m/s. 3,122 people were killed or reported missing and 113,438 houses collapsed.
"Hurricane Katrina" in New Orleans 2005, had a wind velocity of 65-78 m/s.

AIR TIGHTNESS
JIS (A4702-2000 and A4706-2000)

Class	Value to corresponding to each class
	[Air leak 空気漏れ量]
Higher ↑	A-4 (2) 2m ³ / m ² / hour
	A-3 (8) 8m ³ / m ² / hour
	A-2 (30) 30m ³ / m ² / hour
	A-1 (120) 120m ³ / m ² / hour

AIR TIGHTNESS PERFORMANCE

AIR TIGHTNESS PERFORMANCE indicates how much air can pass through gaps between frame and panel of windows and doors.

THE PURPOSE is to evaluate the level of air coming into a room. This performance is also related to dust prevention, sound insulation and thermal insulation.



WATER TIGHTNESS PERFORMANCE

WATER TIGHTNESS PERFORMANCE indicates the rate at which a window can prevent the infiltration of rainwater into a room.

THE PURPOSE is to help select a watertight performance that can prevent interior damage from water intrusion into a room.

WATER TIGHTNESS
JIS (A4702-2000 and A4706-2000)

Class	Value corresponding to each class
	[Pressure difference]
Higher ↑	W-5 (50) 500 Pa
	W-4 (35) 350 Pa
	W-3 (25) 250 Pa
	W-2 (15) 150 Pa
	W-1 (10) 100 Pa



SOUND INSULATION PERFORMANCE

SOUND INSULATION PERFORMANCE indicates a level of sound blocked out from outside to inside.

THE PURPOSE is to measure the level of sound that can be insulated by a window. Each project may have different sound insulation level requirements.



SOUND INSULATION PERFORMANCE
JIS (A4706 and A4702)

Class	Sound transmission class
Higher ↑	T-4 40 dB
	T-3 35 dB
	T-2 30 dB
	T-1 25 dB

SOUND PERCEPTION
Perception towards noises varies among individuals. However, it is said that when the noise level is lowered by 10 dB (A), people feel that the noise level has halved.

Noise level dB(A)	Surrounding noise	Same noise during mid day	Impact on Hearing
110	Klaxon (1m distance) / Sound from press machine		Hearing dysfunction
100	Underneath the elevated railway tracks when trains are running		
90	In trains / At the bowling alley	Beside the railway tracks/ Motorway	Extremely Noisy
80	Intersection of main avenue / Bus traffic level	Residential area in the city/ Motorway / Street of office building	
70	On the street / Taxi traffic level	Residential area in the city/ Motorway / Residential area in suburban district / Street of office buildings	Noisy
60	Inside of department stores/ Normal conversation	Residential area in the city	
50	Quiet offices	Residential area in suburban district	Ideal level for daily life
40	Quiet parks	Residential area in suburban district	
30	Suburban area around midnight		Quiet
20	Whisper		

PRODUCT INDEX

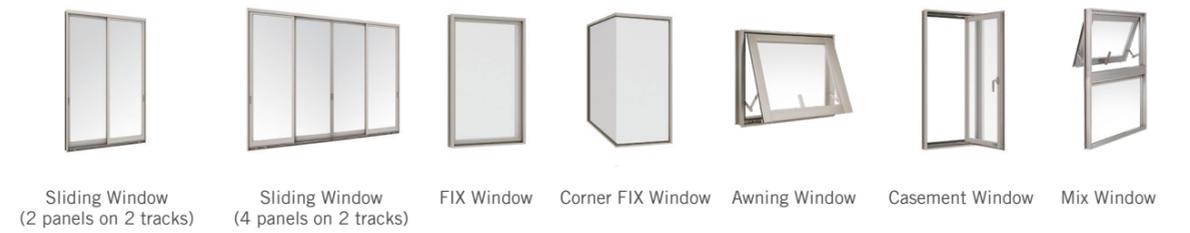
GRANTS Series (Window)



GRANTS Series (Door)



WE Plus Series (Window)



WE Plus Series (Door)



WE70 Series (Window)



Sliding Window (2 panels on 2 tracks) Sliding Window (4 panels on 2 tracks) Sliding Window (3 panels on 2 tracks) SFS FIX Window Corner FIX Window



Awning Window Casement Window Double Casement Window Aluminium Louver Glass Louver MIX Windows

P7 Series (Window)



Sliding Window (2 panels on 2 tracks) Sliding Window (4 panels on 2 tracks) Sliding Window (3 panels on 2 tracks) SFS FIX Window Corner FIX Window



Awning Window Casement Window Double Casement Window Mix Window

WE70 Series (Door)



Sliding Door (2 panels on 2 tracks) Sliding Door (4 panels on 2 tracks) Sliding Door (3 panels on 2 tracks) SFS Sliding Door (3 panels on 3 tracks) Sliding Door (6 panels on 3 tracks) Ventilation Door



Out-Swing Door (Single) Out-Swing Door (Double) In-Swing Door (Single) In-Swing Door (Double) Folding Door Partition Door (2 panels on 2 tracks)



Partition Door (4 panels on 2 tracks) Partition Door (3 panels on 3 tracks) Partition Door (6 panels on 3 tracks) Entrance Sliding Door (2 panels on 2 tracks) Entrance Sliding Door (4 panels on 2 tracks)

P7 Series (Door)



Sliding Door (2 panels on 2 tracks) Sliding Door (4 panels on 2 tracks) Sliding Door (3 panels on 2 tracks) SFS Out-Swing Door (Single) Out-Swing Door (Double)



In-Swing Door (Single) In-Swing Door (Double) Entrance Sliding Door (2 panels on 2 tracks) Entrance Sliding Door (4 panels on 2 tracks)



GRANTS
THE BIGGER & BETTER WINDOW

GRANTS

SERIES

GRANTS series is the flagship series of TOSTEM. The innovative design results in larger surface area of glass for panoramic view. Taking the standard of aluminium windows and doors to another level.



Wind pressure
ASTM E330: 2000 Pa



Air tightness
ASTM E283: 10.7m³ / h·m²



Water tightness
ASTM E300: 300 Pa

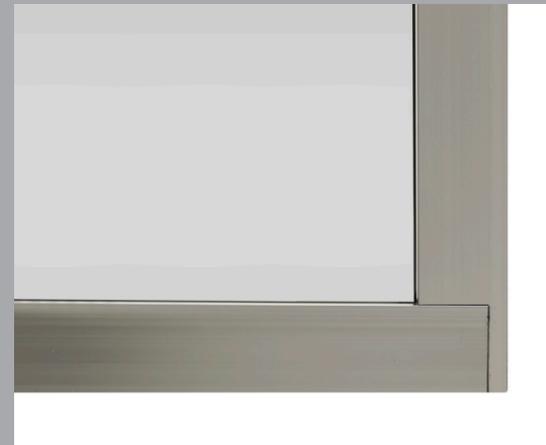


Noise insulation
JIS: 25 dB

* Sound performance test has been done in JIS standard controlled environment. Performance will vary with room condition. Please consult with sound insulation specialist.

Frame depth	101.6 mm/ 120 mm (Sliding)
Height of sill	50 mm
Glass thickness	Up to 31.5 mm

UNIQUE FEATURES



Conceal panel design



Overlapping meeting stiles (4 Panels Sliding)



"L-Fit" design hardware, concealed hinges



Double barrier drainage system



Proportionally designed Mullion and Transom



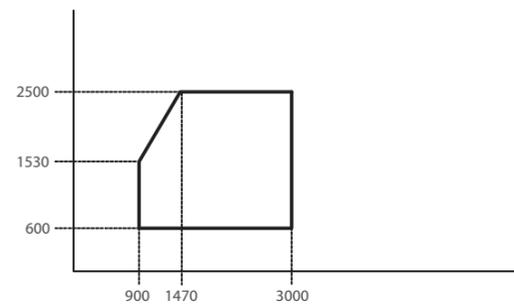
Concealed ventilation system (Optional)

WINDOW

Sliding Window (2 panels on 2 tracks)



- Available in SG and IG unit
- Select panel position from L/R
- Single slide (L/R) available
- Handle option

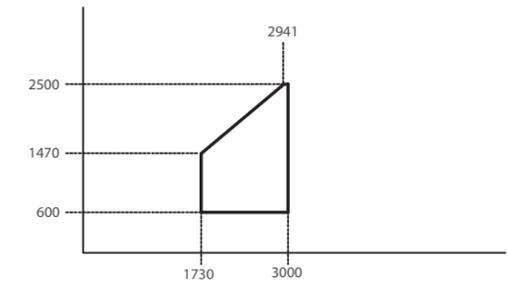


WINDOW

Sliding Window (3 panels on 2 tracks) SFS



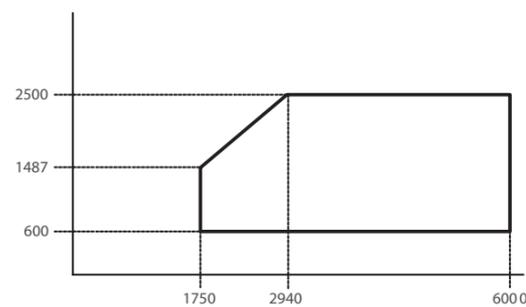
- Available in SG and IG unit
- Handle option



Sliding Window (4 panels on 2 tracks)



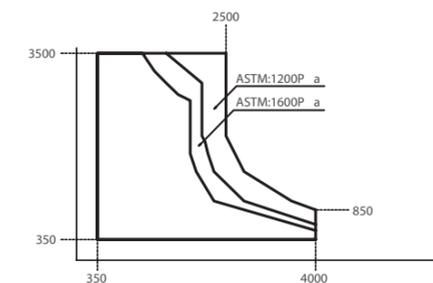
- Available in SG and IG unit
- Handle option



FIX Window



- For oversize fix windows, please consult with our technician

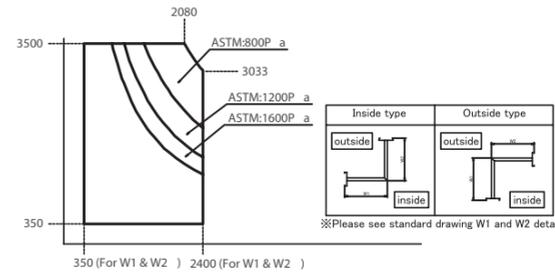


WINDOW

Corner FIX Window



- Only available in SG
- Only available with sealant finish
- Both in/outward corner available

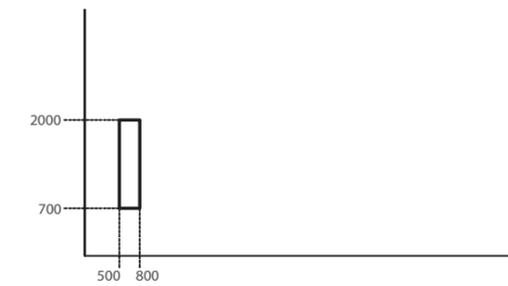


WINDOW

Casement Window



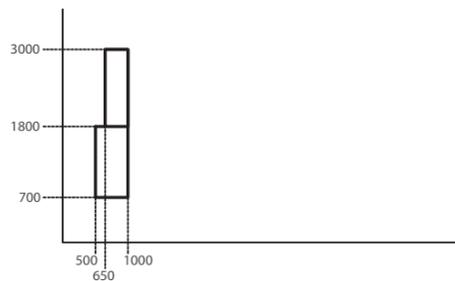
- Available in SG and IG unit
- In case of glass thickness over 8 mm and IG unit please consult with our technician
- Select from L/R



Awning Window



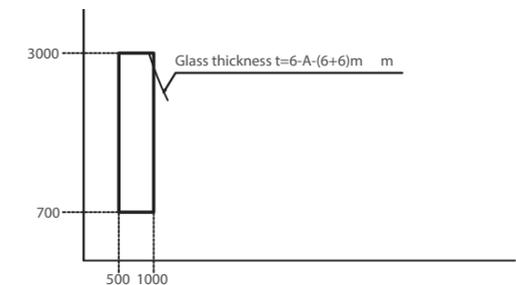
- Available in SG and IG unit
- In case of IG, please consult with our technician for size and performance



Casement Window (with hinge)



- Available in SG and IG unit
- Select from L/R

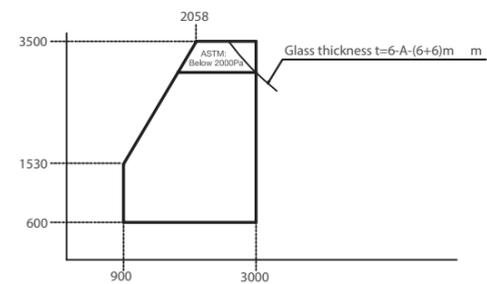


DOOR

Sliding Door (2 panels on 2 tracks)



- Available in SG and IG unit
- Select panel position from L/R
- Single slide (L/R) available
- Handle option

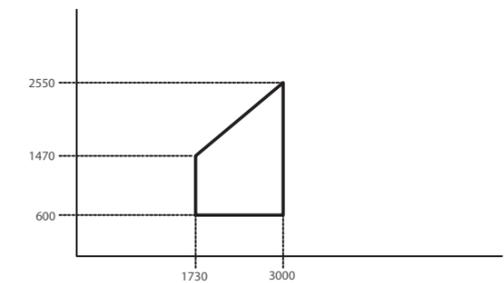


DOOR

Sliding Door (3 panels on 2 tracks) SFS



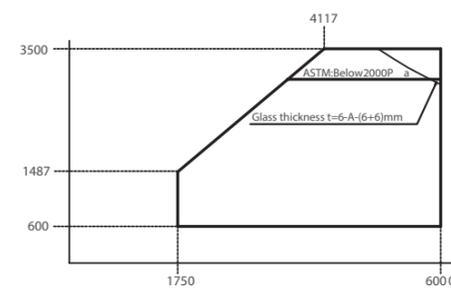
- Available in SG and IG unit
- Handle option



Sliding Door (4 panels on 2 tracks)



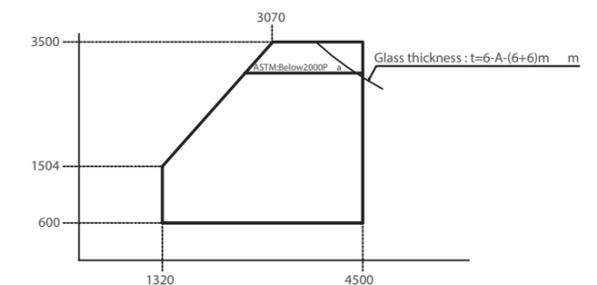
- Available in SG and IG unit
- Handle option



Sliding Door (3 panels on 3 tracks)



- Available in SG and IG unit
- Select panel position from L/R
- Handle option

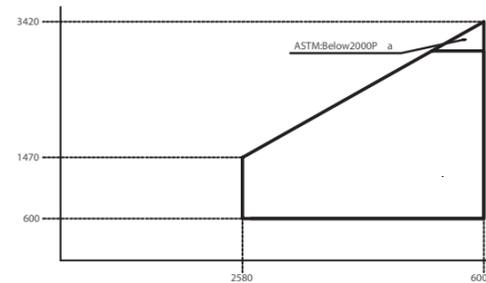


DOOR

Sliding Door (6 panels on 3 tracks)



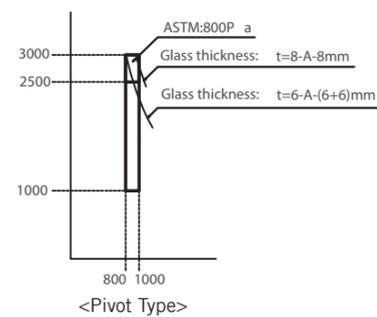
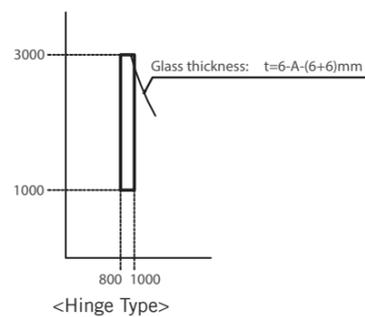
- Available in SG and IG unit
- Handle option



Out-Swing Door (Single)



- Available in SG and IG unit
- Pivot hinge option
- Door closer NOT available
- Select from L/R



MIX & COMBINATION WINDOW

- Mullions are available for each window and door. Please consult with our sales representative for selection.
 - 180°mullion. (Standard and Reinforced)
 - 90°mullion. (Only for Outward Corner)

UNIT WINDOWS

Bottom Windows	Top Windows			
	Single Awning	Single Casement	Single Fix	Sliding
Single Awning			●	
Single Casement			●	
Swing Door			●	
Single Fix	●	●	●	
Double Fix				●

WE PLUS

VERSATILE PRODUCT FOR HIGH-RISE





WE PLUS

SERIES

WE PLUS has passed rigorous tests based on ASTM and TOSTEM in-house toughest standards. Available in various designs with a maximum height of 3 meters to satisfy different designers' needs in the high-rise market.

Frame depth	72 mm
Height of sill	50 mm
Glass thickness	Up to 8 mm



Wind pressure
ASTM E330: 1600 Pa



Air tightness
ASTM E283: 10.7m³/h-m²



Water tightness
ASTM E300: 240 Pa



Noise insulation
JIS: 25 dB

UNIQUE FEATURES



Sliding door meeting stiles are designed to withstand high wind load



High quality security lock



The easily adjustable outer-panel lock



Multi-locking system



Multi-lock handle



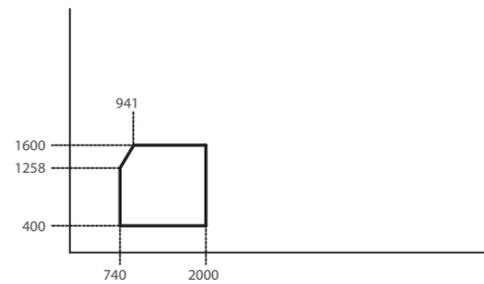
Limit arm (Window Restrictor)

WINDOW

Sliding Window (2 panels on 2 tracks)



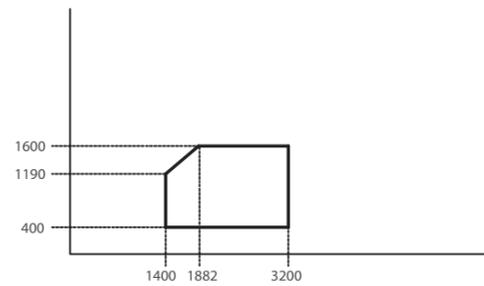
- Inside insect screen available with a special order



Sliding Window (4 panels on 2 tracks)



- Inside insect screen available with a special order

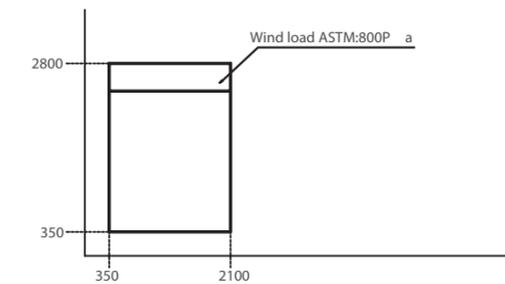


WINDOW

FIX Window



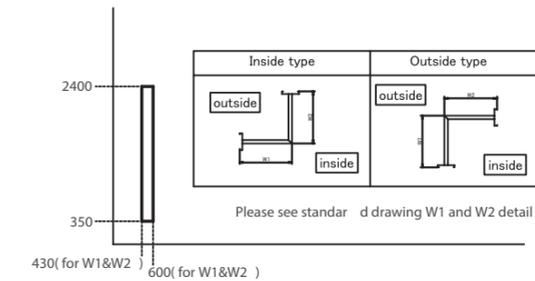
- Wind load performance varies by glass thickness, please consult with our technician



Corner FIX Window



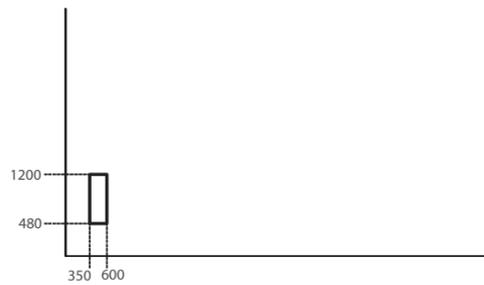
- Available in in/outward corner
- Middle bar (optional)



WINDOW

Awning Window (Single Lock)

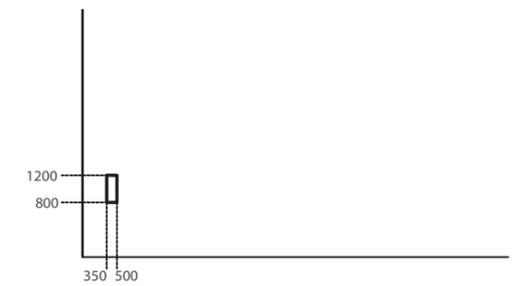
- Insect screen available with a special order



WINDOW

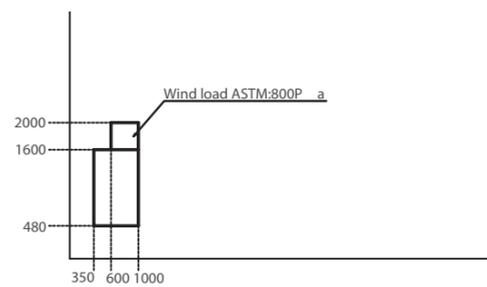
Casement Window (Single Lock)

- Insect screen available with a special order
- Select from L/R



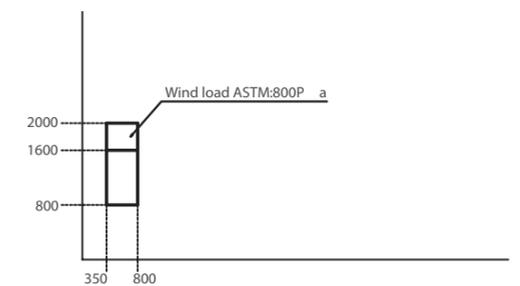
Awning Window (Multi Lock)

- Insect screen NOT available



Casement Window (Multi Lock)

- Insect screen NOT available
- Select from L/R

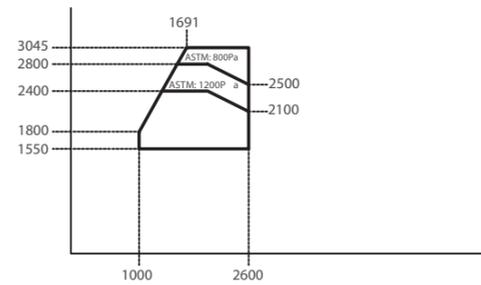


DOOR

Sliding Door (2 panels on 2 tracks)



- Single sliding (L/R) available
- Inside insect screen available with a special order

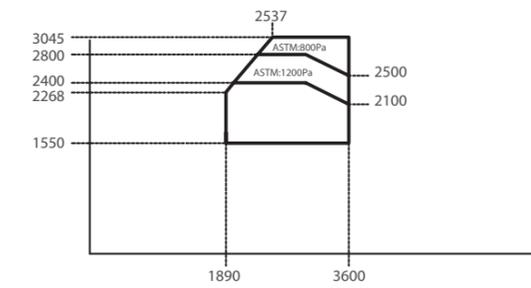


DOOR

Sliding Door (3 panels on 3 tracks)



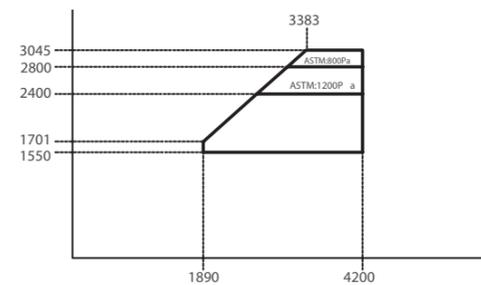
- Inside insect screen available with a special order



Sliding Door (4 panels on 2 tracks)



- Inside insect screen available with a special order

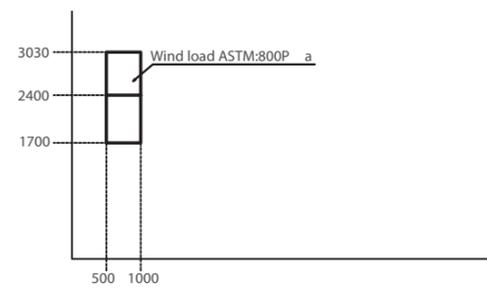


DOOR

Out-Swing Door (Single)



- Select from L/R
 - Sill option (with/without sill)
 - Door closer (optional)
- *in case of non-sill, no performance determined

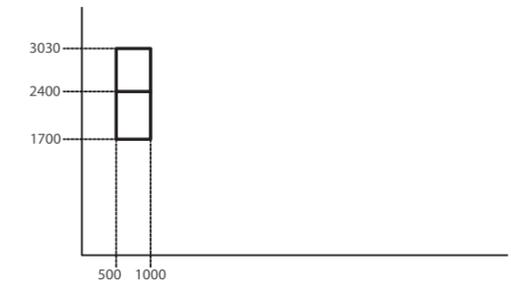


DOOR

In-Swing Door (Single)



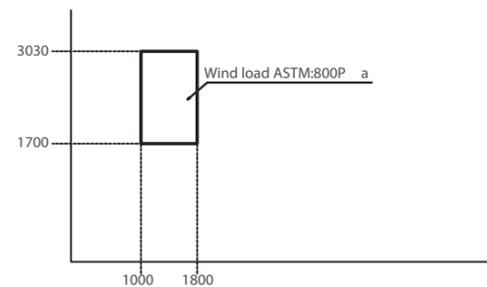
- Select from L/R
- Door closer (optional)
- Only available with Non-sill
- No performance determined



Out-Swing Door (Double)



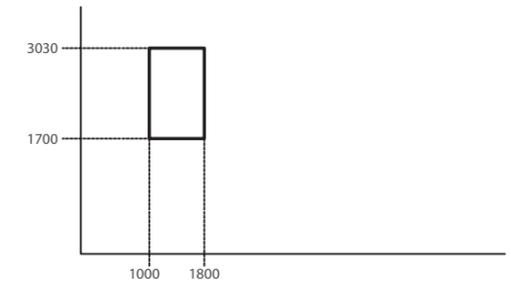
- Select from L/R
 - Sill option (with/without sill)
 - Door closer (optional)
- *in case of non-sill, no performance determined



In-Swing Door (Double)



- Select from L/R
- Door closer (optional)
- Only available with Non-sill
- No performance determined



MIX & COMBINATION WINDOW

Mullions and transoms are available for each window and door. Please consult with our sales representative for selection.

- 180°mullion. (Standard and Reinforced)
- 90°mullion. (Only for Outward Corner)
- Transom. (Standard and Reinforced)

UNIT WINDOWS

Top Windows			
Bottom Windows	Single Awning	Single Casement	1 Panel Fix
Single Awning			●
Single Casement			●
1 Panel Fix	●	●	●



WE70



WE70

SERIES

WE70 series brings legendary TOSTEM quality to everyday life. Built for mass market while maintaining strict quality standards, WE 70 series puts TOSTEM within everyone's reach.

Frame depth	72 mm
Height of sill	35 mm
Glass thickness	Up to 8 mm



Wind pressure
JIS: S-1 (800 Pa)



Air tightness
JIS: A-3



Water tightness
JIS: W-2 (150 Pa)



Noise insulation
JIS: 25 dB

* Sound performance test has been done in JIS standard controlled environment. Performance will vary with room condition. Please consult with sound insulation specialist.

UNIQUE FEATURES



Watertight sill with drainage devices that prevents rain water intrusion



Optional low sliding sill for room partition



High quality security lock



Easily adjustable outer-panel lock



Easy-grip handle



Combination with fixed window without additional Transom.

WE70

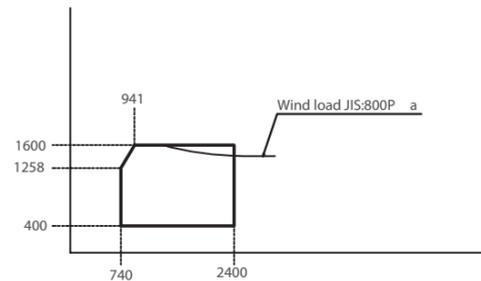


WINDOW

Sliding Window (2 panels on 2 tracks)



- Insect screen available (outside or inside)

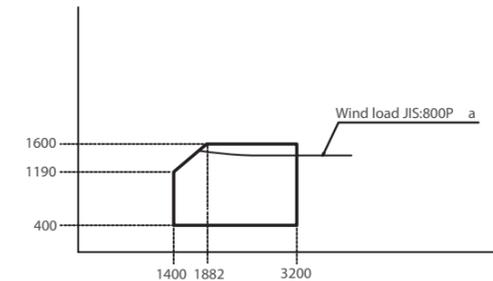


WINDOW

Sliding Window (3 panels on 2 tracks)



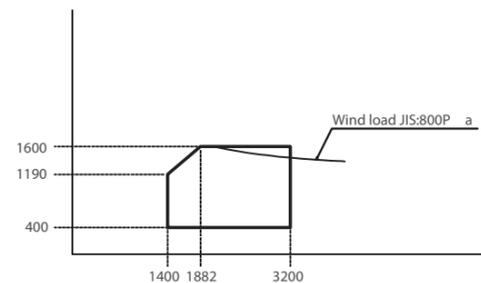
- Insect screen available (outside or inside)



Sliding Window (4 panels on 2 tracks)



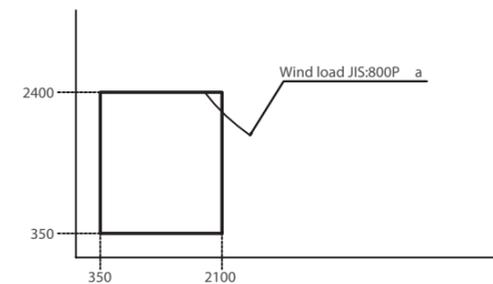
- Insect screen available (outside or inside)



FIX Window



- Up to 4 fix windows with unitized mullion
- Wind load performance varies by glass thickness
Please consult with our technician

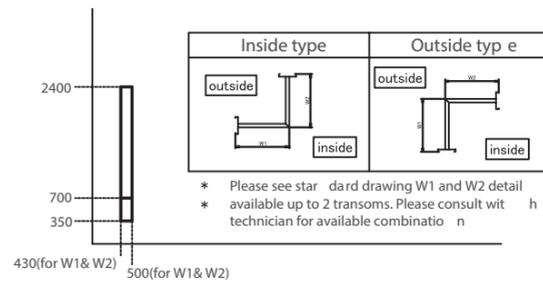


WINDOW

Corner FIX Window



- Both In/outward corner available
- Middle bar (optional)

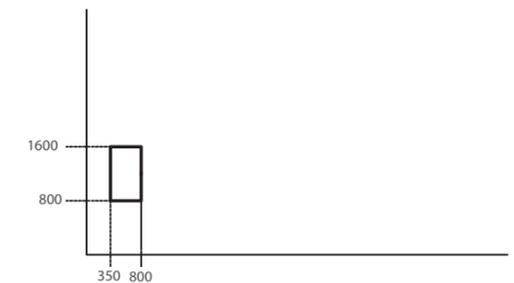


WINDOW

Casement Window



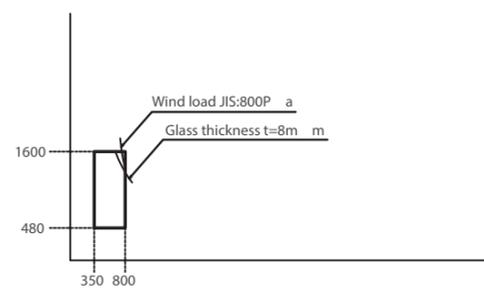
- L/R available
- Insect screen available



Awning Window



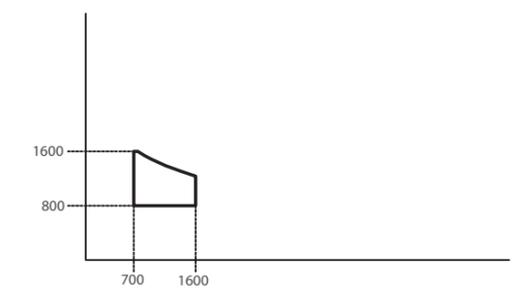
- Insect screen available



Double Casement Window



- Insect screen available

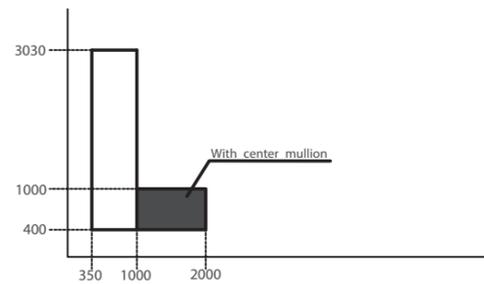


WINDOW

Aluminium Louver



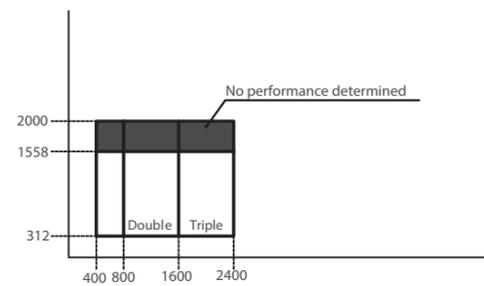
- No performance determined



Glass Louver



- Single, double, triple are available
- Insect screen available
- Water performance JIS: W-1 (100Pa)



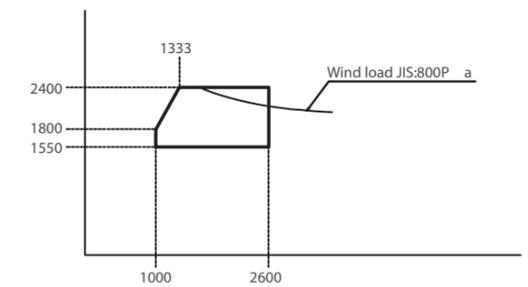
*Please consult with our sales rep for lead-time

DOOR

Sliding Door (2 panels on 2 tracks)



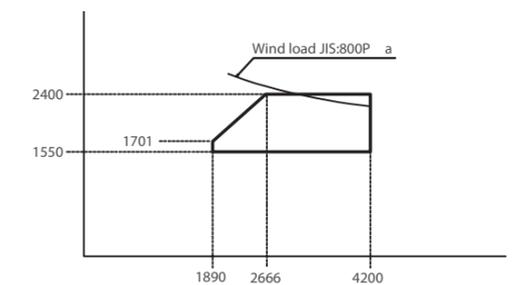
- Sill options (standard & floor finish)
- Single sliding available (L/R)
- Insect screen available (inside or outside)



Sliding Door (4 panels on 2 tracks)



- Sill options (standard & floor finish)
- Insect screen available (inside or outside)

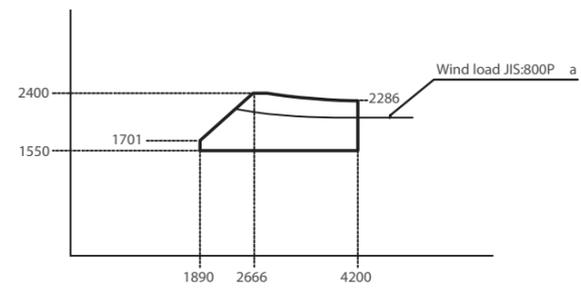


DOOR

Sliding Door (3 panels on 2 tracks) SFS



- Sill options (standard & floor finish)
- Insect screen available (inside or outside)

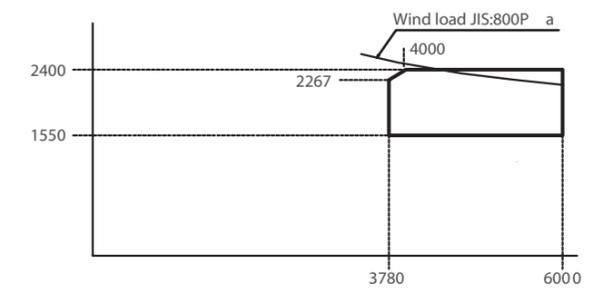


DOOR

Sliding Door (6 panels on 3 tracks)



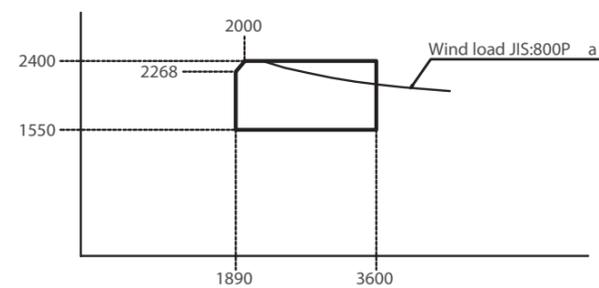
- Sill options (standard & floor finish)
- Insect screen available (inside or outside)



Sliding Door (3 panels on 3 tracks)



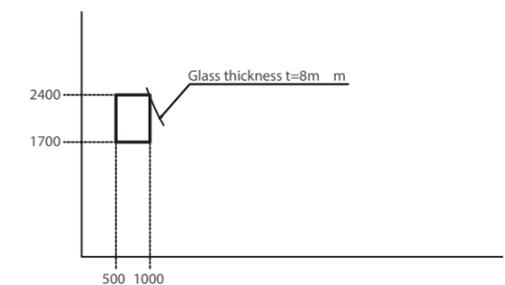
- Sill options (standard & floor finish)
- Insect screen available (inside or outside)



Ventilation Door



- Select from L/R
- Door close (optional)
- Lattice with screen available



DOOR

Out-Swing Door (Single)





Glass



With Middle Bar

- Select from L/R
- Sill option (with/without sill)
- Door closer (optional)
- Insect screen available with louver door

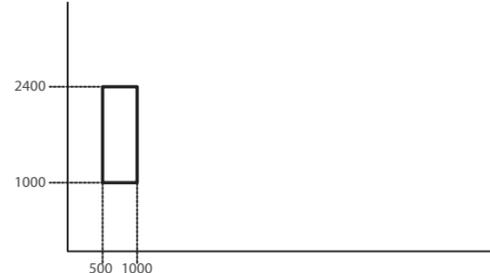
*in case of non-sill, no performance determined



Aluminium Louver



Glass & Louver



The performance chart shows a vertical axis with values 1000 and 2400, and a horizontal axis with values 500 and 1000. A rectangular box is drawn with its top-left corner at (500, 1000) and its bottom-right corner at (1000, 2400).

DOOR

In-Swing Door (Single)





Glass



With Middle Bar

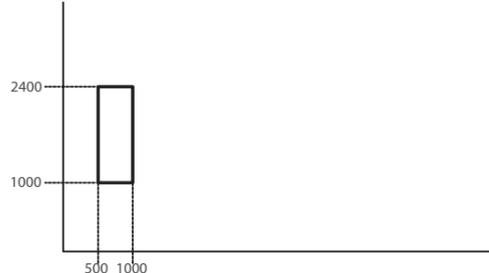
- Select from L/R
- Non-sill only
- Door closer option
- Insect screen available with louver door
- No performance determined



Aluminium Louver



Glass & Louver



The performance chart shows a vertical axis with values 1000 and 2400, and a horizontal axis with values 500 and 1000. A rectangular box is drawn with its top-left corner at (500, 1000) and its bottom-right corner at (1000, 2400).

Out-Swing Door (Double)





Glass



With Middle Bar

- Select from L/R
- Sill option (with/without sill)
- Door closer (optional)
- Insect screen available with louver door

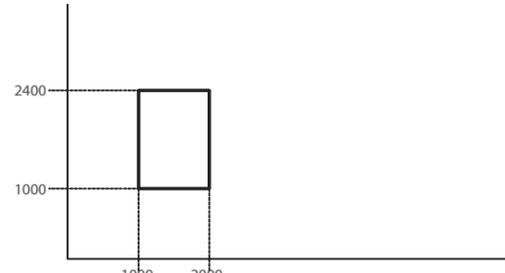
*in case of non-sill, no performance determined



Aluminium Louver



Glass & Louver



The performance chart shows a vertical axis with values 1000 and 2400, and a horizontal axis with values 1000 and 2000. A rectangular box is drawn with its top-left corner at (1000, 1000) and its bottom-right corner at (2000, 2400).

In-Swing Door (Double)





Glass



With Middle Bar

- Select from L/R
- Non-sill only
- Door closer option
- Insect screen available with louver door
- No performance determined



Aluminium Louver



Glass & Louver



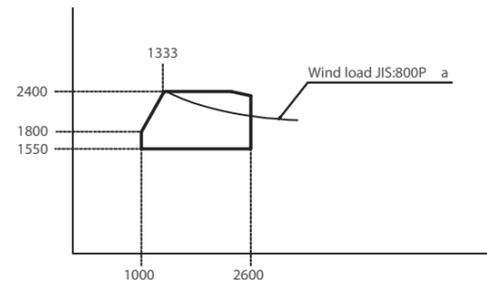
The performance chart shows a vertical axis with values 1000 and 2400, and a horizontal axis with values 1000 and 2000. A rectangular box is drawn with its top-left corner at (1000, 1000) and its bottom-right corner at (2000, 2400).

DOOR

Entrance Sliding Door (2 panels on 2 tracks)



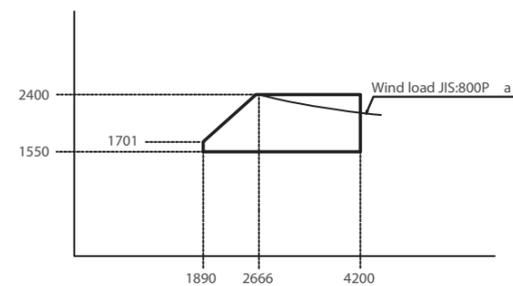
- Sill options (standard & floor finish)
- Single sliding available (L/R)
- Insect screen available (outside only)



Entrance Sliding Door (4 panels on 2 tracks)



- Sill options (standard & floor finish)
- Insect screen available (outside only)



MIX & COMBINATION WINDOW/DOOR

Mullions and Transoms are available for each windows and doors. Please consult with our sales representative for selection.

- 180°mullion. (Standard)
- 90°mullion. (Only For Outside Corner)
- Transom. (Standard)

UNIT WINDOWS

Bottom Windows	Top Windows											
	Sliding Window (2 panels on 2 Tracks)	Sliding Window (4 panels on 2 Tracks)	Sliding Window (3 panels on 3 Tracks) SFS	Single Awning	Single Casement	Double Casement	1 Panel Fix	2 Panels Fix	3 Panels Fix	4 Panels Fix	Outward Corner Fix	Inward Corner Fix
Sliding Window (2 panels on 2 Tracks)							•	•				
Sliding Window (4 panels on 2 Tracks)								•	•	•		
Sliding Window (3 panels on 2 Tracks) SFS								•	•	•		
Single Awning							•					
Single Casement							•					
Double Casement							•	•				
1 Panel Fix	•			•	•	•	•					
2 Panels Fix	•	•	•			•		•	•	•		
3 Panels Fix		•	•				•	•	•	•		
4 Panels Fix		•	•				•	•	•	•		
Outward-Corner Fix											•	
Inward-Corner Fix												•

UNIT DOORS

Bottom Doors	Top Windows			
	1 Panel Fix	2 Panels Fix	3 Panels Fix	4 Panels Fix
Sliding Door (2 panels on 2 Tracks)	•	•		
Sliding Door (4 panels on 2 Tracks)		•	•	•
Sliding Door (3 panels on 2 Tracks) SFS		•	•	•
2 Panels Fix		•	•	•
3 Panels Fix		•	•	•
4 Panels Fix		•	•	•
Swing Door (Single)	•			
Swing Door (Double)	•			



FOLDING DOORS

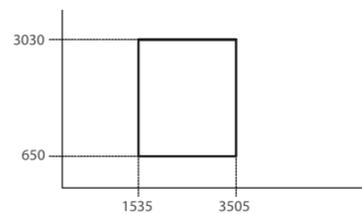
DOOR

Folding Door (4 panels)



- Select from L/R
- Sill options (standard & flat)
- 1 panel cannot exceed 40kg.
- Choose from
 - One - way open
 - Both - way open
 - Center open

*In case of flat-sill, no performance determined



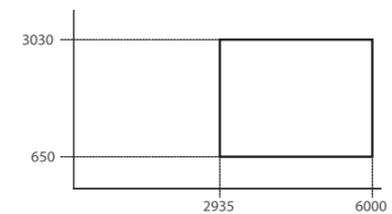
DOOR

Folding Door (8 panels)



- Select from L/R
- Sill options (standard & flat)
- 1 panel cannot exceed 40kg.
- Choose from
 - One - way open
 - Both - way open
 - Center open

*In case of flat-sill, no performance determined

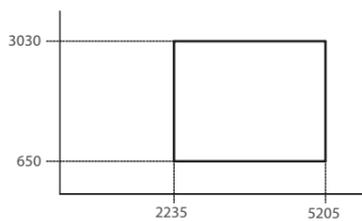


Folding Door (6 panels)



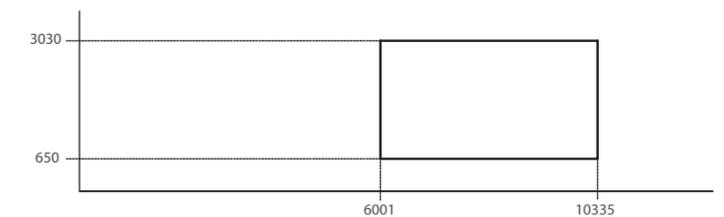
- Select from L/R
- Sill options (Standard & Flat)
- 1 panel cannot exceed 40 kg
- Choose from
 - One - way open
 - Both - way open
 - Center open

*In case of flat-sill, no performance determined

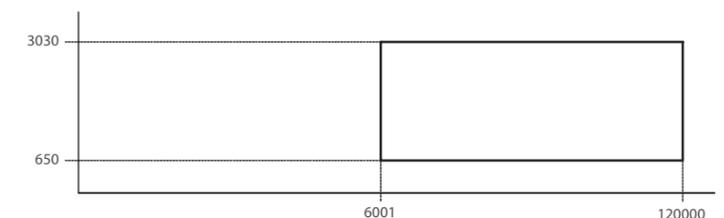


Folding Door (12,16 panels)

- Sill options (Standard & Flat)
- 1 panel cannot exceed 40kg
- Center open only
- No performance determined



<12 Panels>



<16 Panels>

P7

GOOD FIT FOR ROW HOUSES



P7



P7

SERIES

P7 series is a luxury residential series, using only the most premium materials and luxurious features for specialty and high-end residential properties. Suitable for low-rise luxury projects.

Frame depth	101.6 mm
Height of sill	50 mm
Glass thickness	up to 8 mm



Wind pressure
JIS: S-2 (1200 Pa)



Air tightness
JIS: A-4



Water tightness
JIS: W-3 (250 Pa)



Noise insulation
JIS: 25 dB

* Sound performance test has been done in JIS standard controlled environment. Performance will vary with room condition. Please consult with sound insulation specialist.

UNIQUE FEATURES



Watertight sill with drainage devices that prevents rain water intrusion



Vertical panel frame that provides easy opening and closing



Easily adjustable outer-panel lock



High quality security lock



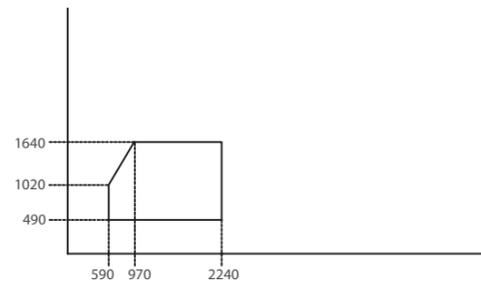
High security sub-lock come standard

WINDOW

Sliding Window (2 panels on 2 tracks)



- Outside insect screen available
- Sill attachment (optional)

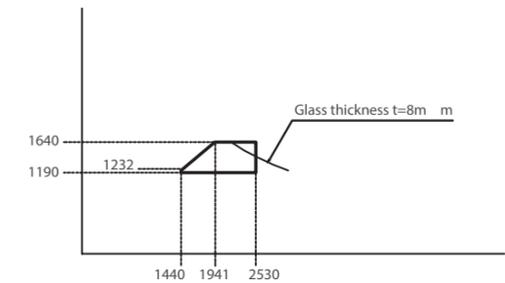


WINDOW

Sliding Window (3 panels on 2 tracks) SFS



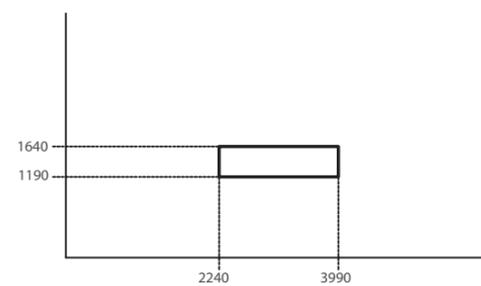
- Outside insect screen available
- Sill attachment (optional)



Sliding Window (4 panels on 2 tracks)



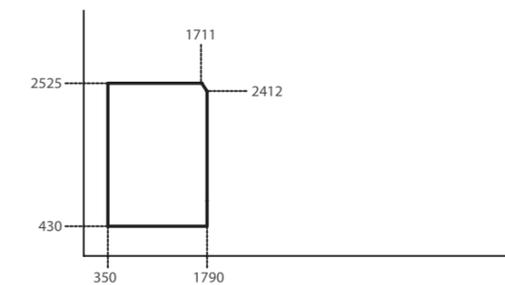
- Outside insect screen available
- Sill attachment (optional)



FIX Window



- Wind load performance varies by glass thickness, please consult with our technician



WINDOW

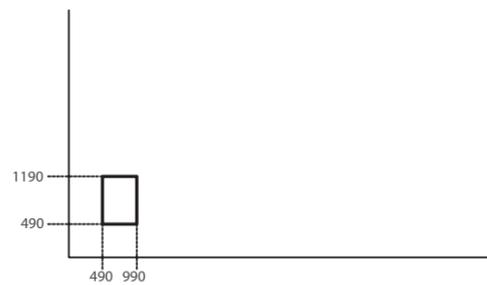
Corner FIX Window



- By special order only
- Out side corner only

Awning Window

- Insect Screen available

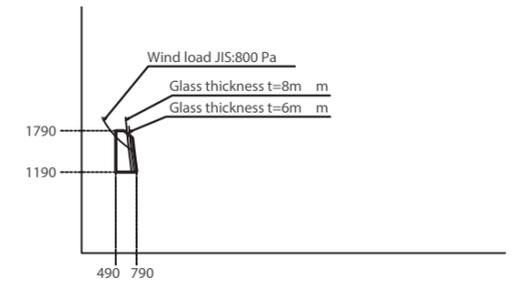


WINDOW

Casement Window

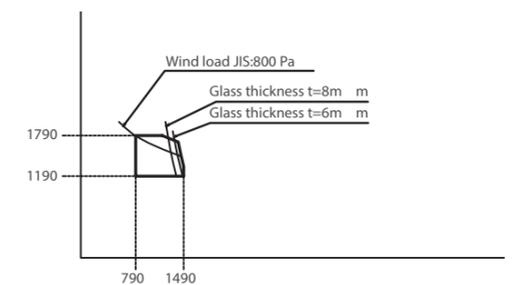


- Select from L/R
- Insect screen available



Double Casement Window

- Insect Screen available

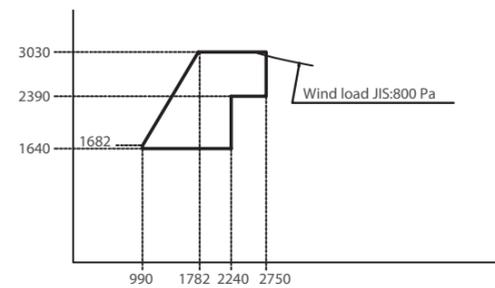


DOOR

Sliding Door (2 panels on 2 tracks)



- Single sliding available (L/R)
- Outside insect screen available
- Sill attachment (optional)

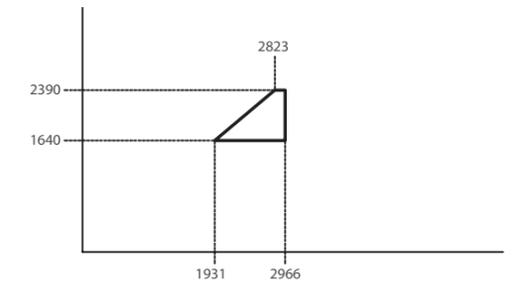


DOOR

Sliding Door (3 panels on 2 tracks) SFS



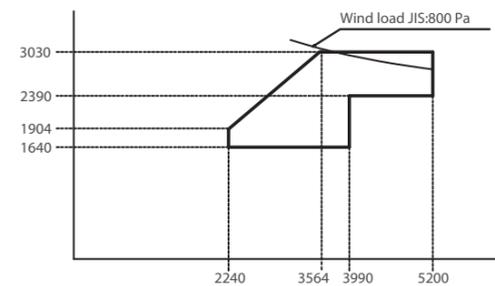
- Outside insect screen available
- Sill attachment (optional)



Sliding Door (4 panels on 2 tracks)



- Outside insect screen available
- Sill attachment (optional)

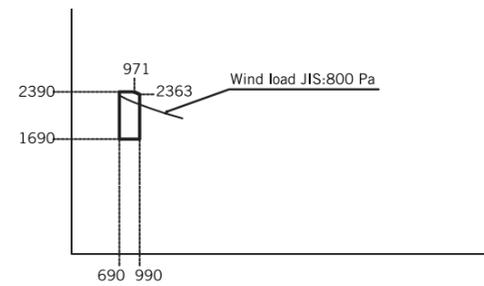


DOOR

Out-Swing Door (Single)



- Select from L/R
 - With / without sill available
 - Door closer option
- *in case of non-sill, no performance determined

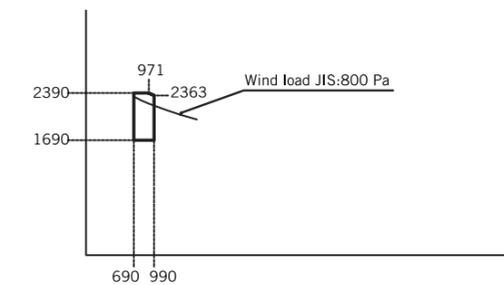


DOOR

In-Swing Door (Single)



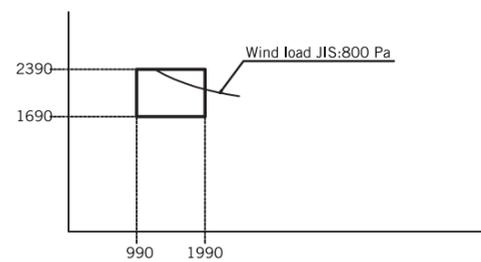
- Select from L/R
- Door closer option
- Non-sill
- No performance determined



Out-Swing Door (Double)



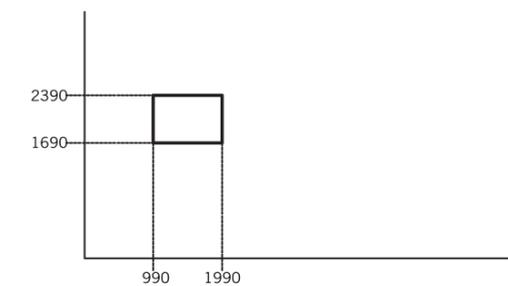
- Select from L/R
 - With / without sill available
 - Door closer option
- *in case of non-sill, no performance determined



In-Swing Door (Double)



- Select from L/R
- Door closer option
- Non-sill
- No performance determined

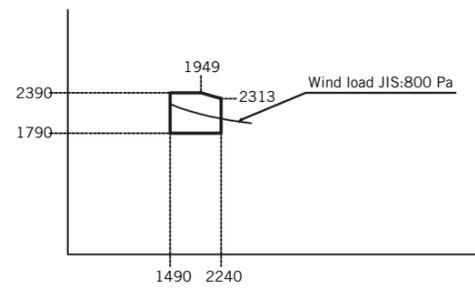


DOOR

Entrance Sliding Door (2 panels on 2 tracks)



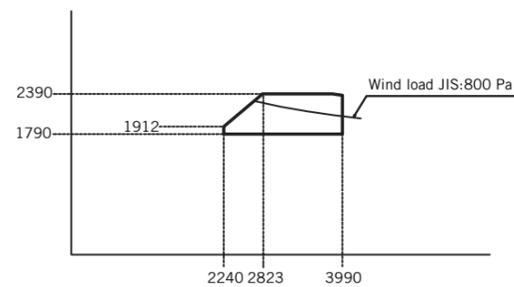
- Single sliding available (L/R)
- Outside insect screen available
- Sill attachment (optional)



Entrance Sliding Door (4 panels on 2 tracks)



- Outside insect screen available
- Sill attachment (optional)



MIX & COMBINATION WINDOW

Mullions and Transoms are available for each window and door. Please consult with our sales representative for selection.

- 180°mullion.
- 90°mullion. (Only for Outward Corner)
- Transom.

* Hinges cannot be on Mullion side in case of swing door

