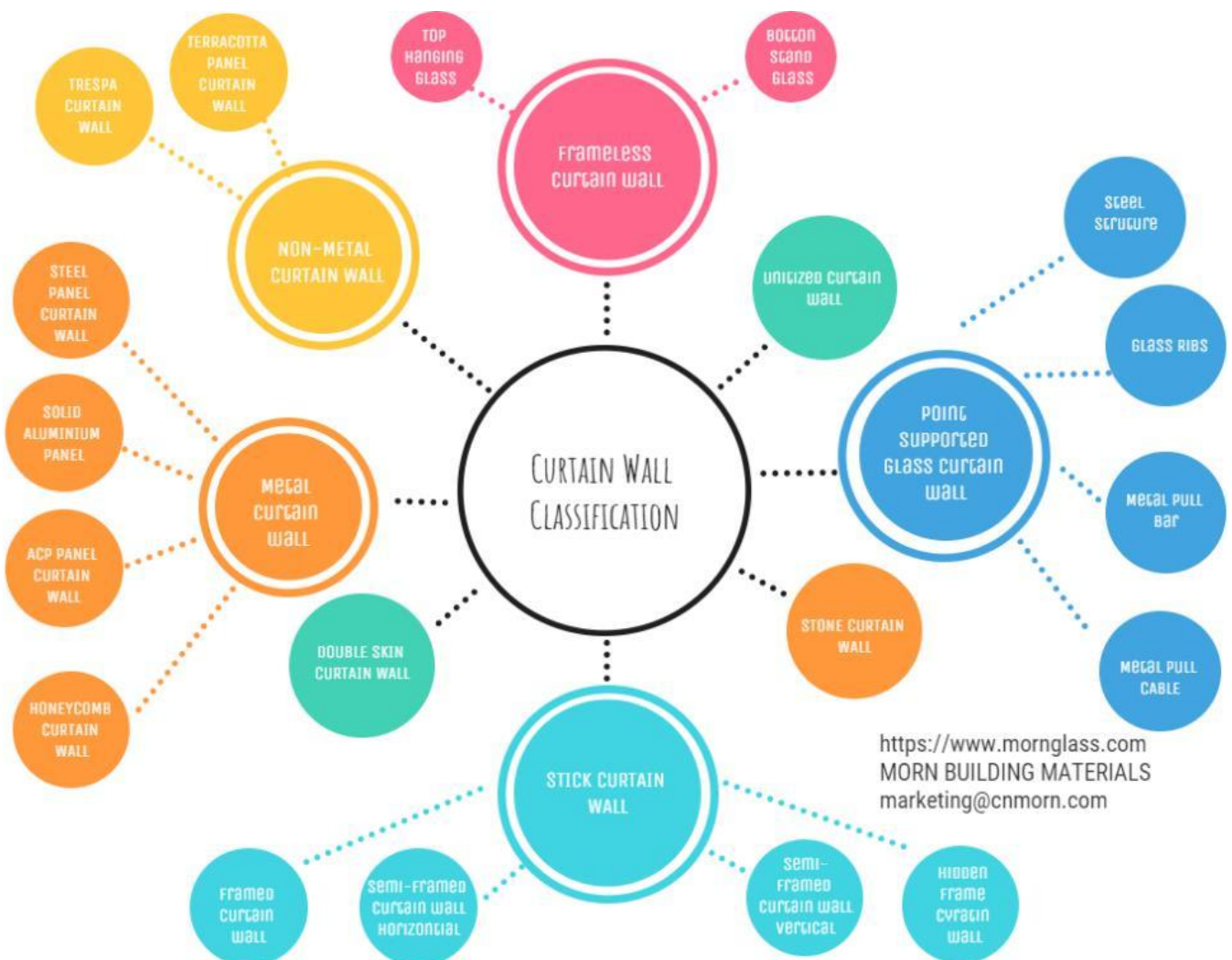


2021 Glass Curtain wall classification,component, features

Curtain Wall has been used in construction projects 150 years ago (the mid-19th century). Due to the limitations of materials and processing techniques at that time, the curtain wall could not achieve absolute water tightness, air tightness, and resistance to various natural external forces. Invasion (such as wind, earthquake, temperature), thermo-physical factors (heat radiation, condensation), sound insulation, fire prevention and other requirements have not been well developed and promoted.

Today, curtain walls are not only widely used in the exterior walls of various buildings, but also in the interior walls of buildings with various functions, such as communication rooms, TV studios, airports (airports), large stations, stadiums, museums, cultural centers, and large buildings. Hotels, shopping malls, etc. Here we introduce the modern curtain wall classification, components and features.





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FRAMELESS CURTAIN WALL

The frameless curtain wall, or all glass curtain wall, is a kind of glass curtain wall with full transparency and full view. It uses the transparency of glass to pursue the circulation and integration of the space inside and outside the building, so that people can see through the glass. Clearly seeing the entire structural system of the glass makes the structural system change from a pure supporting role to its visibility, thus showing the artistic, layered and three-dimensional sense of architectural decoration. It has the characteristics of light weight, simple material selection, factory-oriented processing, quick construction, convenient maintenance and repair, and easy cleaning. Its effect on enriching the architectural modeling and facade effect is unmatched by other materials, and it is the embodiment of modern technology in architectural decoration.





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The surface glass can be single glass, insulated glass, and [laminated glass](#) and so on; normally the glass is tempered glass. Glass fin may adopt single tempered glass or laminated glass. This type of curtain wall contains Bottom stand Frameless Glass Curtain Wall and Top Hang Frameless Glass Curtain Wall.

Bottom Stand glass curtain wall:

The surface glass is fixed in the top and bottom glass slot. The glass dead load is sustained by the bottom slot. The surface glass can be four sides or two opposite sides supporting. When supported by the vertical two sides and the glass cannot meet the intensity or rigidity requirements, the vertical glass fin is needed. when the height of surface glass exceeds scope of the relevant standards and specification, we have to change the bottom sitting style to top hang style.

Top Hang Glass curtain wall

The surface glass top hangs to the bottom of the main structure beam above it, and the glass load pass to the main structure through hanging device. The horizontal wind load and other external loading are born by the vertical glass fin installed in the same manner. Usually, the surface glass is single glass and the fin glass can be single glass or laminated glass.





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The most features all glass curtain wall application is [oversized laminated glass used in apple store](#) ,the facade covers 11 pieces laminated glass panels ,each panels size is 15M*3M and weight almost 10Mt,for this size ,it's impossible to stand the glass itself for glass weight reason,all these panels are hanged and create unique appearance.



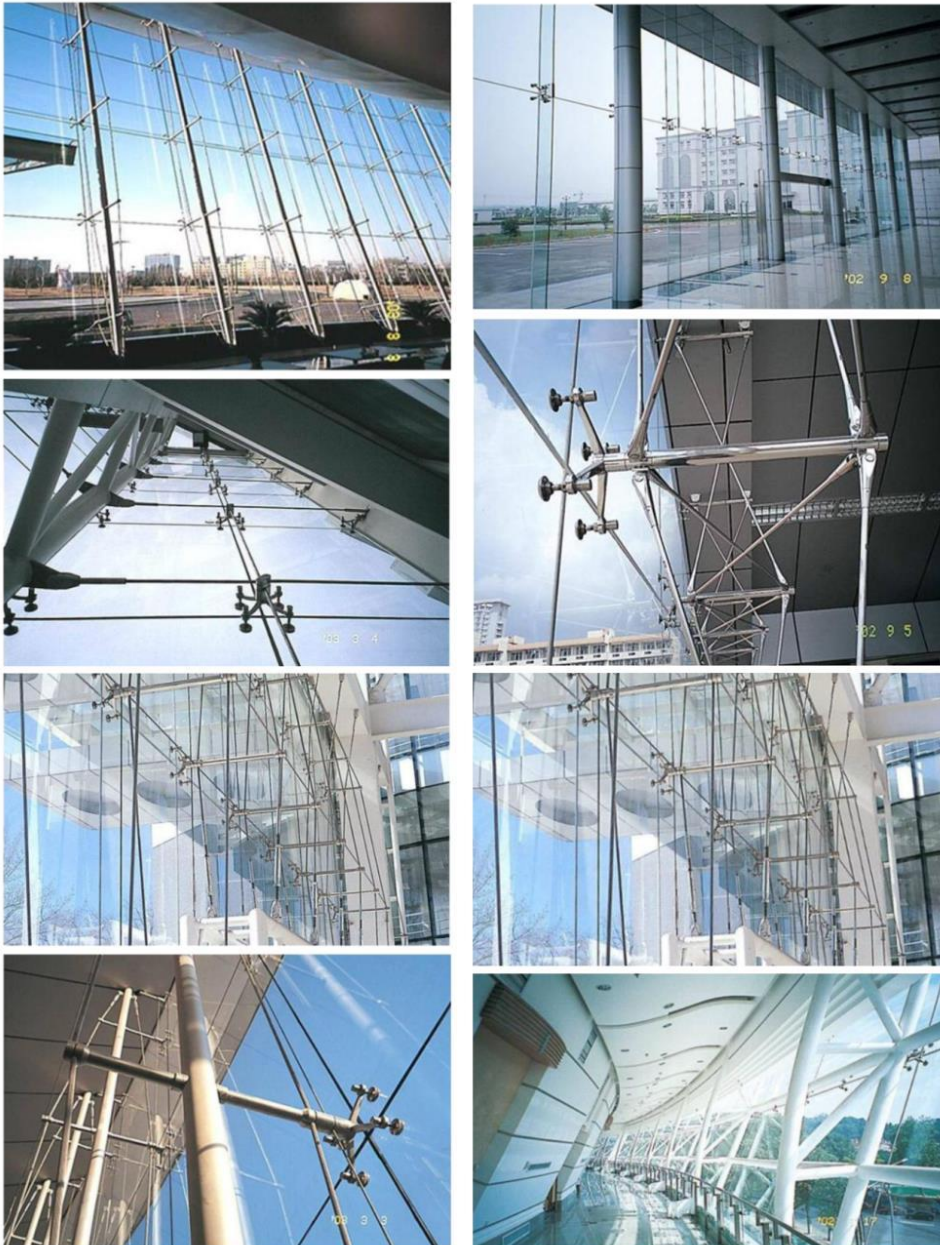
POINTED SUPPORTED CURTAIN WALL

Each grid glass is fixed by point-connected steel parts, and the various loads and actions (wind load, earthquake action, temperature action, etc.) it bears are connected by point-connected steel parts and [glass spiders](#) is transmitted to the force supporting structure system, and then from the intermediate force supporting structure system to the main structure; the point-connected steel parts use spherical hinge bolts (freely rotatable), and the spherical hinge bolts The center of rotation is consistent with the center of gravity of the glass, which can eliminate the glass displacement caused by external forces (wind load, seismic action, temperature action, etc.). There are several forms such as "H" shape and "X" shape. The force supporting structure system supporting glass can be glass ribs, steel structures , or stainless steel pull bar, cables or hybrid structures. Therefore, the point-connected full curtain wall can be divided into glass rib point supported full-glass curtain wall, steel rod point-supported glass curtain wall, steel cable point fixed glass curtain wall, and mixed structure glass curtain wall.



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Same as frameless glass facade, glass used in point supported glass are usually 15, 19mm toughened glass, or typically 21.52mm [tempered laminated glass](#), the glass ribs are 21.52mm, 25.52mm and sometimes even thicker laminated glass to ensure facade safety.

STICK CURTAIN WALL SYSTEM

Stick curtain wall system, or framed curtain wall system, the mullion (or beam) of the component curtain wall is first installed on the main structure, and then the beam (or mullion) is installed. The mullion and the beam form a lattice, and the panel material (glass, aluminium panels) are fixed on the frame system with sealant or glue to prevent rainwater penetration and air penetration. The load of the panel material unit components must be transmitted to the main structure through the mullions (or beams).

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The main features of framed curtain wall

- (1) Flexible construction methods and relatively mature technology. After more engineering practice tests, more curtain wall structures are currently used.
- (2) The main structure has strong adaptability, and the installation sequence is basically not affected by the main structure.
- (3) Good water tightness and air tightness, good heat preservation , sound insulation and noise reduction ability, and a certain degree of resistance to interlayer displacement .
- (4) The facade panels are made in the factory, and the performance of the structural adhesive is guaranteed.
- (5) A large number of installation procedures are carried out on-site, requiring a large workload of on-site management.
- (6) The sealant construction requirements are strict. The process of pre-cleaning and glueing requires high quality of workers; there are many control points for installation and glueing and many procedures.

Stick glass curtain wall means that glass works as the external panel,**according to the facade appearance,the stick curtain wall can be classified into framed curtain wall,semi framed curtain wall and [hidden frame curtain wall](#).**

Typical glass panels used in stick curtain wall system are [insulated glass](#) with high performance low-E coatings to keep building thermal properties and reduce heating&cooling costs.





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Beside glass panels ,especially insulated glass panels,many other facade materials can be used in the stick curtain wall system,for example solid aluminium panels, ACP aluminium panels,Aluminium honeycomb aluminium panels,steel panels,stones,UHPC facade,GRC facade,terracotta panel curtain wall,and even PC panels can be used in stick curtain wall system.



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UNITIZED CURTAIN WALL SYSTEM

The [unitized curtain wall](#) is composed of many independent units. The installation of all the panels and the sealing of the indirect seams of the panels are processed and assembled in the factory. After classification & number, unitized curtain wall panels are transported to the construction site for hoisting & installation according to the engineering installation sequence, and the installation can be combined with the main structure (5-6 floors difference is enough).



Its main features are:

- (1) The processing and production of curtain wall units in the factory is easy to realize industrialized production, reducing labor costs, and controlling the quality of the units; a large number of processing and preparation work are completed in the factory, thus shortening the curtain wall site construction period and engineering construction period.
- (2) The mosaic connection between the unit has a strong ability to adapt to the displacement of the main structure, and can effectively absorb earthquake effects, temperature changes, and inter-story displacement. The unit curtain wall is more suitable for super high-rise buildings and pure steel high-rise buildings.
- (3) Adhesive strips & gaskets are used to seal the joints, and weather-resistant glue is not used and is not affected by weather.



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(4) Strict construction organization and management are required, and there is a strict construction sequence during construction, and installation must be carried out in the order of insertion. There are strict restrictions on the placement of construction machinery such as vertical transportation equipment for the main construction, otherwise it will affect the installation of the entire project.

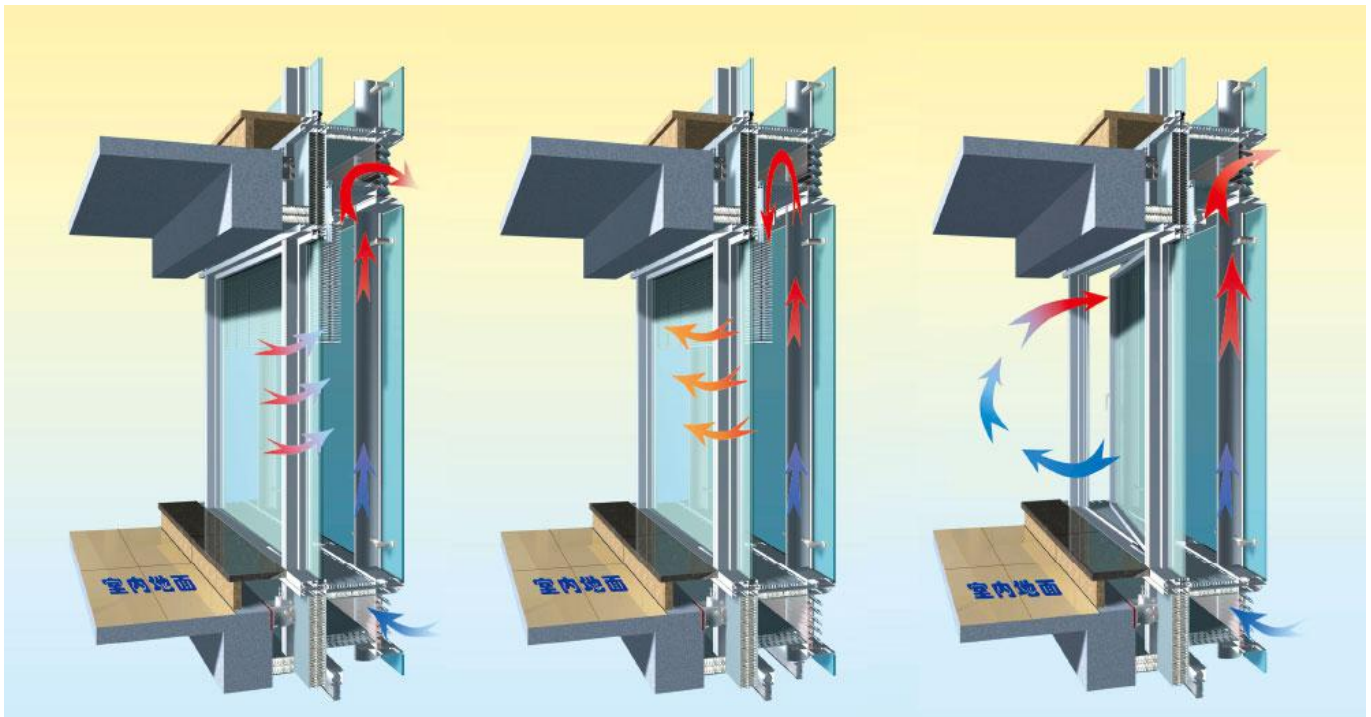
Below video shows the installation of unitized curtain wall installation on site:

<https://www.youtube.com/watch?v=qyY9Fx8pNts>

DOUBLE SKIN CURTAIN WALL SYSTEM

Double-skin curtain walls are also called dynamic ventilating, heat channel or breathing facade. Based on the optimized design and scientific configuration of system, the double-skin facade can improve the thermal performances of external envelope, interior ventilation, acoustic insulation, and interior lighting control.

The thermal conductivity and shading characteristics of the double-Skin curtain wall can significantly reduce energy consumption in the building. By passively using light energy, the heat loss through the double-layer curtain wall in winter can be reduced by 30%, and the heat dissipation at night in summer can reduce the use of air conditioners, thereby reducing energy loss. If the night heat dissipation and louvers are used correctly, the indoor temperature can also be kept lower than the outdoor.



The double sin curtain wall system can be classified into:

Natural Ventilating (External Circulation) Double-skin Curtain Wall System



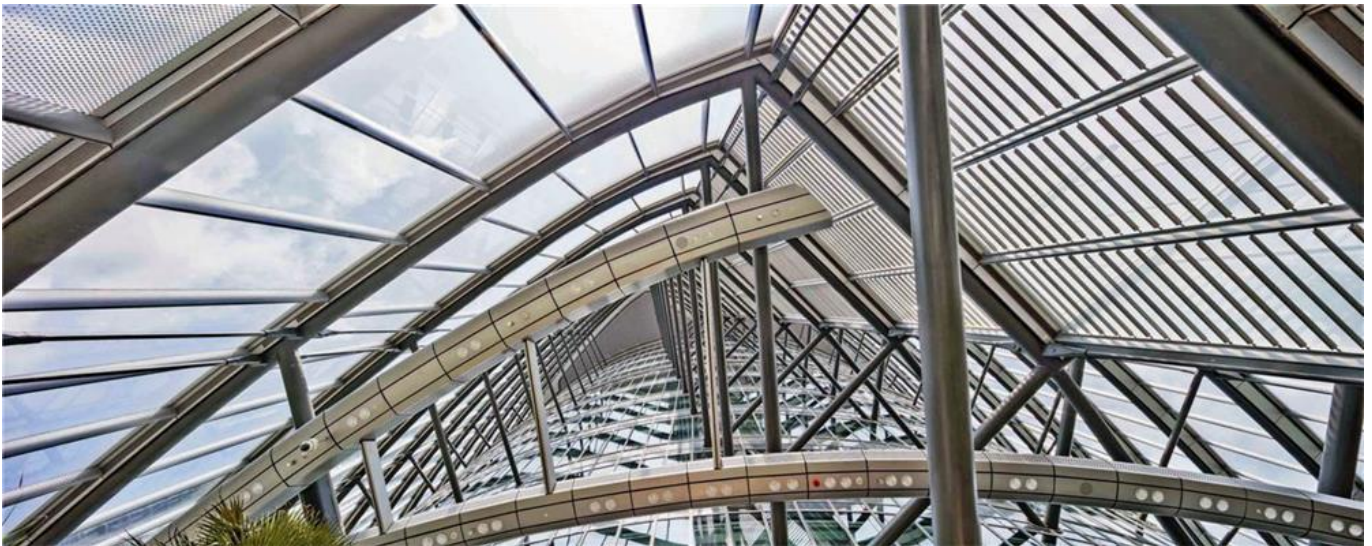
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Mechanical Ventilating (Internal Circulation) Double-Skin Curtain Wall System

Mixed Ventilation (Internal / External Circulation) Double-skin Curtain Wall System

Sealed Maintenance-Free Double Glazing Curtain Wall System



The most typical double skin glass facade used in China is Shanghai tower, After optimization, under the typical working conditions of the transition season, more than 90% of the main functional rooms in the building have an average natural ventilation frequency of no less than 2 times per hour. Natural ventilation can be achieved during the spring and autumn transition seasons, even without air conditioning. With the double-layer curtain wall, the energy consumption for heating and cooling is about half lower than that of the single-layer curtain wall. Shanghai Tower got LEED certificate.

Morn is your turnkey architectural glass manufacturer and supplier, welcome contact us for more info if you got any curtain wall projects, whether it's stick curtain wall, all glass curtain wall and unitized curtain wall system.

Extend:

[Using the right glass for your glass curtain wall](#)

[THE BENEFIT OF DOUBLE GLAZED UNITS FOR CURTAIN WALL](#)

Tags: curtain wall, glass facade, all glass curtain wall, point supported glass wall, stick curtain wall, hidden frame curtain wall, unitized glass facade, double skin curtain wall, insulated glass, laminated glass, curtain wall classification, curtain wall features, curtain wall glass



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