

# Ensuring your system is legally compliant is only one factor in establishing your system is fit for purpose

Although aesthetically pleasing a glass balustrade's principle function is as a safety barrier.

If the design of your glass balustrade doesn't meet regulations, it could prove dangerous, expensive and can even make you liable if things go wrong.

When we design your system, we are ensuring your measurements are correct and are providing a 3D CAD drawing for you or your client to visualise the system in situ prior to manufacture. We also ensure that the system itself meets BS 6180 :2011 via physical or static calculations. However, this is not enough to ensure your system is fit for purpose as there are important site-specific variable hazards that are unique to every job that you must take into consideration.

The principle factors will be covered below and although this list is not exhaustive you can feel confident before buying your balustrade you have taken due care and diligence.

- Domestic or commercial use
- Internal and external use
- Wind load
- Local topography
- Height of fall
- Substrate and anchoring
- Fixed seating within 530mm of the balustrade for business use - see chart opposite
- Implications of system failure predominantly glass damage - what is below the balustrade

Once you have read our advice pages please refer back to the chart opposite to correctly identify what kN rated system you require.

Type of Occupancy for part of the Building	Examples of specific uses	Horizontal uniformly Distributed Line load (kn/m)
Domestic and Residential Activities	(i) All areas within or serving exclusively one single family dwelling including stairs, Landings etc. But excluding external balconies and edges of roofs.	0.36
	(i) Other residential, i.e Houses of multiple occupancy and balconies, Including Juliette balconies and edges of roofs in single family dwellings.	0.74
Offices and work areas not included elsewhere, including storage	(iii) Light access stairs and gangways not more than 600mm wide	0.22
	(iv) Light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.36
	(v) Areas not susceptible to overcrowding in office and institutional buildings, Also industrial and storage buildings except as given above	0.74
Areas where people might congregate	(vi) Areas having fixed seating within 530mm of the barrier, Balustrade or parapet	1.5
Areas with tables or fixed seating	(vii) Restaurants and bars	1.5
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) Stairs, Landings corridors ramps	0.74
	(ix) External balconies including Juliette balconies and edges of roofs, Footways and pavements within building cartilage adjacent to basement/sunken areas	
Areas susceptible to overcrowding	(X) Footways or pavement less than 3 m wide adjacent to sunken areas	0.74
	(xi) Theatres, Cinemas, Discotheques, Bars, Auditoria, Shopping malls, Assembly areas, Studios footways or pavements greater than 3 m wide adjacent to sunken areas	1.5
	(xii) Grandstands and stadia	Not available
Retail Areas	(xiii) All retail areas including public areas of banks/building societies or betting shops	1.5
Vehicular	(xiv) Pedestrian areas in car parks, Including stairs, Landings, Ramps, Edges of internal floors, Footways, Edges of roofs.	Not available
	(xv) Horizontal loads imposed by vehicles	Not available



## Domestic or commercial

Residential or business use as well as the type of business use and potential associated foot traffic must be considered when you select your kN rating - make sure you have correctly identified your commercial application.

## Wind load & height of fall

Post no handrail is suitable in a high wind load area if you follow the high wind load anchoring solution.

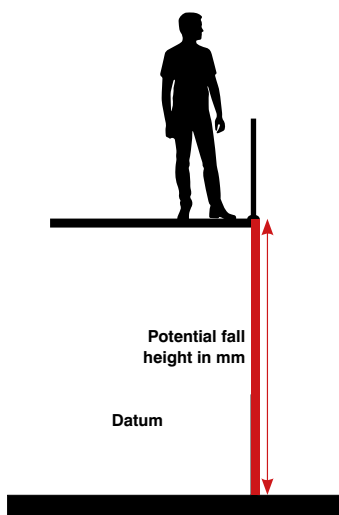
### RECOMMENDATIONS: VERY IMPORTANT PLEASE READ

Any property with a high wind load or a height 8m must make sure you follow and use the high wind load anchoring solutions laid out at [/important-documents-and-certification/](#)

For any system over 8m it is worth considering adding a handrail for additional security even though the technical data supports the system without a handrail. This is purely a recommendation.

## Height of your balustrade

Please see the diagram showing height of fall. If your system is offering protection from a potential fall 600mm or higher you must have a legally compliant system. Under 600mm this is considered more a partition and you do not need a fully compliant system. It is also important to consider how high above sea level your system is.



## Location of your property

The strength of wind – and therefore the design of your glass balustrade – depends on where your property is located in the UK. There are various tools online that you can utilise to calculate wind load in your area based on your postcode. Please indicate if you have a low, medium or high wind load to the CAD team. Generally it is better to err on the side of caution and select a higher rated system if you are borderline.

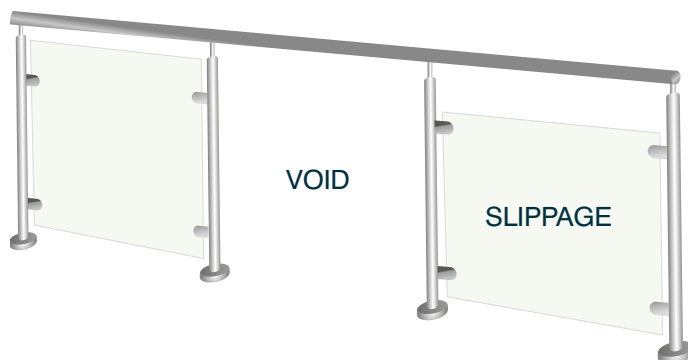
## Internal or external

Indoor or outdoor use will dictate the systems height so please make sure your quote is correct in identifying this. Legally stairs and internal balustrades need to be a minimum of 900mm in height from the datum or externally a minimum of 1100mm.

## Local topography

If your balcony or terrace is exposed to the elements, you'll need a much stronger balustrade. Perhaps you live on the coast or on high ground, or even in an urban location in a high-rise block. In all these instances your balustrade will encounter higher wind loads and as such please ensure you fix the system using the wind load anchoring solutions.

## Toughened v toughened laminated



In the diagram above the breakage shown is what would happen if using single glaze toughened glass - single glaze toughened glass can only be used in conjunction with a hand rail. However as you can see there is potential risk whilst a repair is undertaken. In the picture below you are shown a broken panel of toughened glass. As you can see when broken it breaks safely into tiny cubes. However, using single glaze toughened presents two issues that require your consideration. Firstly, in the event of breakage there is a void within the balustrade system while it is waiting to be repaired. Secondly there is the potential hazard of broken glass falling on people below. It is up to you to make a judgment call on whether these factors are serious enough to consider the move towards using toughened laminated - All our designs ensure that in the event of slippage the glass cannot fall out of the clamps using holes in toughened laminated or simply via the positioning of our clamps in standard toughened configurations.

Single glaze toughened glass is legally compliant if using it with a handrail. It is x5 times stronger than normal glass, but we recommend single glaze toughened glass is viable with protection of fall heights lower than 3m and the possibility of glass falling onto someone is considered low.



# Substrate and anchoring

All systems need to be tested into concrete to get physical test results for BS 6180:2011.

We have independent structural engineer reports for anchoring into concrete, steel and timber under various wind load conditions available to download at [www.made2measure.co.uk/important-documents-and-certification](http://www.made2measure.co.uk/important-documents-and-certification)

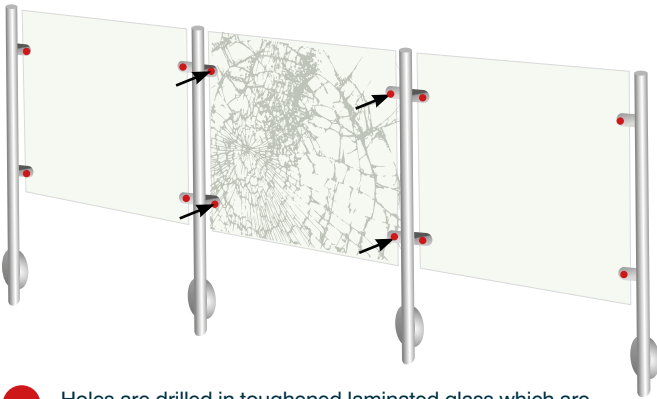
Bear in mind you need to follow these instructions exactly with the same grades of concrete, steel and timber to be valid. If not you can use them for guidance purposes. If you are not going into any other substrate we would always recommend you pass your fixing solution through to building control prior to purchase to verify they deem the solution viable. Although all our systems are legally compliant to BS6180:2011 this does not mean they are fit for your own site-specific intended use. It is your responsibility to take into consideration the various issues raised in this section and to ensure your substrate and proposed anchoring solution is strong enough to cope with the loads being placed upon them.

Correctly Identifying your substrate is critical.

We do not supply fixings as this is the responsibility of the installer to correctly select and identify based on the site-specific conditions. We offer recommended fixings solutions in our guides.

## Pre purchase check list

Have I correctly identified commercial or residential use?	<input type="checkbox"/>
Have I correctly identified internal or external use?	<input type="checkbox"/>
Have I considered the operating height of the system?	<input type="checkbox"/>
Have I considered protection from fall height?	<input type="checkbox"/>
Have I considered potential hazards in the event of breakage?	<input type="checkbox"/>
Have I considered wind load and my topography?	<input type="checkbox"/>
Have I considered my anchoring and substrate?	<input type="checkbox"/>
Do I need remedial work?	<input type="checkbox"/>
<b>Based on the above information:</b>	
I Have checked my system kN rating?	<input type="checkbox"/>
I Have considered carefully my glass type selection?	<input type="checkbox"/>
I Have considered whether to use a handrail or not?	<input type="checkbox"/>



Holes are drilled in toughened laminated glass which are held in place by the glass clamp security pin. These pins keep the glass in position in the event of breakage and are therefore essential for any side mounted system or where you wish to have a system with no handrail at height.

In the diagram above and picture below we have shown what happens in the event of breakage when using toughened laminated glass. You can use toughened laminated with or without a handrail, but we recommend you select a handrail on any system over 3m to 8m although test data does not require this. As you can see in the event of breakage there is no void and glass will not fall onto anyone below.

In the highly unlikely event of both panels breaking and there is no handrail being utilised the panel itself would still be held in the channel avoiding the risk of glass falling on people below. In such instances there would however still be a void.

Toughened laminated is becoming more and more popular as the default choice for glass balustrades due to the fact there is very low risk of glass falling onto someone in the event of breakage and a greatly reduced risk of a void being present during a potential repair.



If a laminate panel breaks it is important not to remove the broken laminate panel until you are ready to replace it. In the case of a broken single toughened pane it is important to fill the void with a timber sheet until ready to replace with a new panel. Both these options help maintain the strength of the system during the replacement process.