

BALCONIES

This document is intended to provide general recommendations only. Trespa provides these guidelines and all testing, code and design data for informational purposes only and strongly advises that the customer, project owner and architect seek independent advice from a certified construction professional and/or engineer regarding application and installation as well as compliance with design requirements, applicable codes, laws and regulations, and test standards. Please check your local codes and applicable design requirements for proper use.

General

Trespa® Meteon® may be used as vertical exterior wall coverings such as balustrade cladding. National standards, regulations and certificates must be observed when designing and installing balustrade cladding using Trespa® Meteon® panels.

Trespa® Meteon® has only been tested as cladding for balustrades according to the German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”).

The tested fixing methods, in combination with Trespa® Meteon® as a balustrade cladding material, fulfilled the requirements of this ETB guideline with regard to their resistance in case of hard and soft impact. The technical details in this document are based on this German guideline and test.

General guidelines

The following aspects must receive attention when designing and installing balustrade cladding using Trespa® Meteon® panels:

- The complete German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”) must be observed.
- The customer, project owner and architect must always seek independent advice from a construction professional regarding the accordance to national and/or local building regulations of balustrade cladding. Trespa does not make any representations as to the implications of using a specific use or fixing system and disclaims any and all liability or damages related thereto.
- Balustrade heights, maximum permissible openings in the cladding material and anchor facilities must be in accordance with the provisions of the applicable local standards, regulations and certificates.
- When balustrade systems are used, please observe and follow the installation guidelines provided by the balustrade system manufacturer.
- When fixing Trespa® Meteon® as strips, the height of the strips must at least be equal to half the support distance.
- Allow for free panel movement of 2.5 mm per metre ($\pm 3/100$ in per foot) in the length and in the width.
- Any modification to Trespa® panels or components thereof, its geometry or its specifications, and any use or installation of Trespa® panels or fixing system in combination with any material or component other as advised by Trespa, shall be exclusively at the risk of the parties involved in such modification, use or installation, and each of such parties assumes all such risks.



Technical installation details

The various fixing options for Trespa® Meteon® have been tested with the applicable additional loads and stresses in accordance with German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”). The results of these tests have been incorporated in the following technical installation details and tables.

Balustrade system

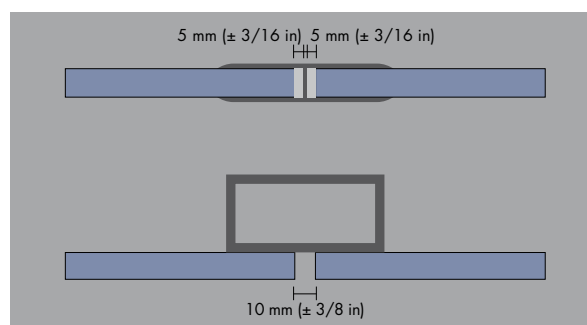
Trespa® panels must be installed using a balustrade system of sufficient strength and permanent durability. Quality and/or treatment of the balustrade system must be in accordance with applicable building standards, regulations and certificates.

Joints

In all cases, tolerances with respect to the panel, assembly and building itself play an important role in the joint details.

Therefore the following guidelines apply:

- Allow for free panel movement of 2.5 mm per metre ($\pm 3/100$ in per foot) in the length and in the width.
- Allow for at least 5 mm ($\pm 3/16$ in) space around every single panel.
- Ensure a minimum joint width of 10 mm ($\pm 3/8$ in) between two panels.
- If joint profiles are used, their body thickness must be considered as well.

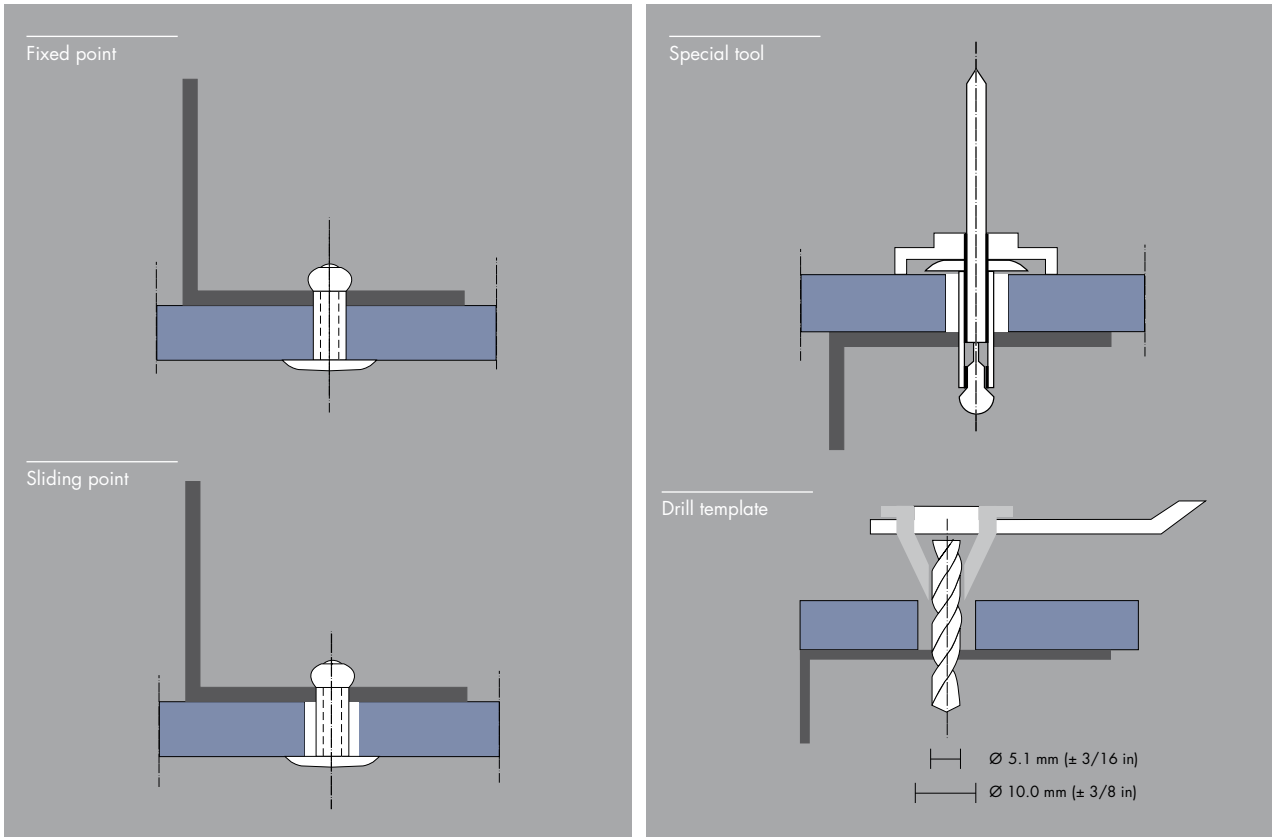


Fixing with rivets

Panels may be fixed using aluminium rivets (AlMg5) or stainless steel rivets (available in a wide range of Trespa® Meteon® colours through third parties). Only stainless steel rivets must be used for steel balustrade systems. For suppliers of fixings, please contact your local Trespa representative. **Note:** use blind rivets and rivet tools of the same brand to ensure uniform dimensions.

- Trespa® Meteon® panels with a minimum thickness of 6 mm ($\pm 1/4$ in) may be fixed using rivets.
- Shank diameter of the rivet is 5 mm ($\pm 3/16$ in).
- Head diameter of the rivet is 16 mm ($\pm 5/8$ in).
- Minimum length of the rivet: thickness of the panel + thickness of balustrade system (sub-frame) + 5 mm ($\pm 3/16$ in). Total length must be at least 16 mm ($\pm 5/8$ in).
- Hole diameter in the panel for fixed point is 5.1 mm ($\pm 3/16$ in).
- Hole diameter in the panel for sliding point is 10 mm ($\pm 3/8$ in).
- The rivet head should be 0,3 mm ($\pm 1/8$ in) free from the panel surface by using a special tool (spacer nosepiece).
- To retain the panel position, each panel must have one fixed point in the centre of the panel. Tighten the blind rivet on the fixed point without using the special tool. All other fixing points are sliding points.
- Rivets must always be centered in the holes.
- Drill holes for sliding points using a stepped drill or a drilling template, so that the shank of the rivet is perfectly centered in the wider hole drilled.
- Edge clearance must be at least 20 mm ($\pm 3/4$ in) to the center of the hole and maximum 20 x panel thickness.
- The maximum permissible panel length is 3050 mm (± 120 in).

Diameter of the hole	in the panel	in the subframe
Fixed point	5.1 mm ($\pm 3/16$ in)	5.1 mm ($\pm 3/16$ in)
Sliding point	10 mm ($\pm 3/8$ in)	5.1 mm ($\pm 3/16$ in)



Fixing with balcony screws

Panels may be fixed using stainless steel balcony screws (available in a wide range of Trespa® Meteon® colours through third parties). For suppliers of fixings, please contact your local Trespa representative.

- Trespa® Meteon® panels with a minimum thickness of 6 mm (± 1/4 in) may be fixed using screws.
- Shank diameter of the screw is 5 mm (± 3/16 in).
- Head diameter of the screw is 16 mm (± 5/8 in).
- Minimum length of the screw: thickness of the panel + thickness of balustrade system (sub-frame) + 10 mm (± 3/8 in).
- Hole diameter in the panel for fixed point is 5.1 mm (± 3/16 in).
- Hole diameter in the panel for sliding point is 10 mm (± 3/8 in).
- To retain the panel position, each panel must have one fixed point in the centre of the panel. All other fixing points are sliding points.
- Screws must always be centered in the holes and must not be over tightened.
- Edge clearance must be at least 20 mm (± 3/4 in) to the center of the hole and maximum 20 x panel thickness.
- The maximum permissible panel length is 3050 mm (± 120 in).

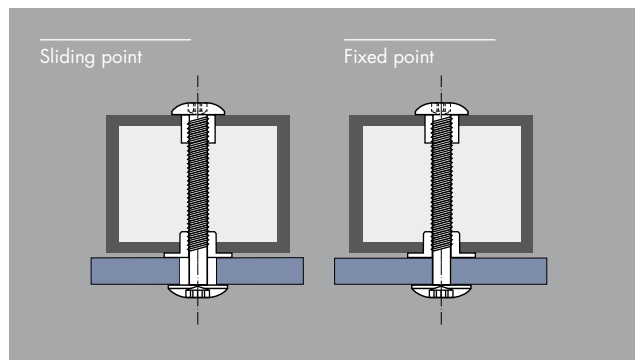
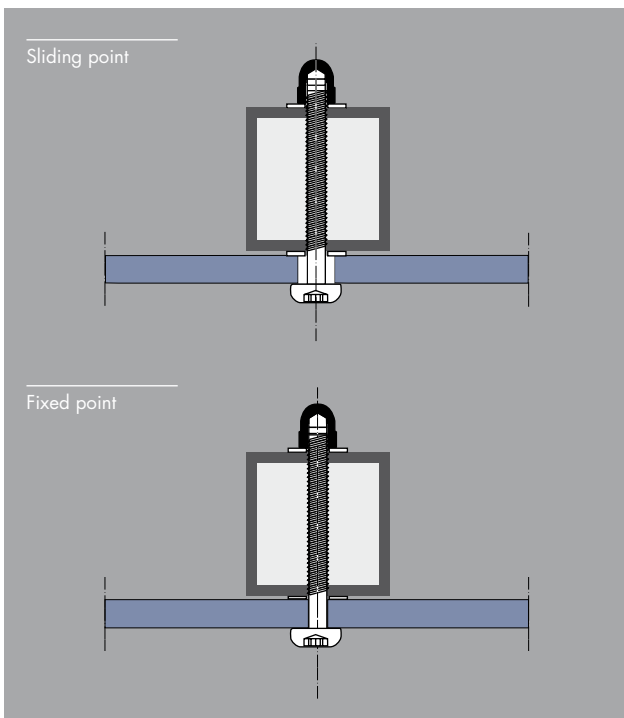
Diameter of the hole	in the panel	in the subframe
Fixed point	5.1 mm (± 3/16 in)	5.1 mm (± 3/16 in)
Sliding point	10 mm (± 3/8 in)	5.1 mm (± 3/16 in)

Balcony screws with sleeves

Panels may be fixed using stainless steel balcony screws (available in a wide range of Trespa® Meteon® colours through third parties) and accompanying stainless steel sleeves. The sleeves are also coated available in a wide range of Trespa® Meteon® colours through third parties. For suppliers of fixings, please contact your local Trespa representative.

- Trespa® Meteon® panels with a minimum thickness of 6 mm ($\pm 1/4$ in) may be fixed using balcony screws with sleeves.
- Shank diameter of the screw is 5 mm ($\pm 3/16$ in).
- Head diameter of the screw with is 16 mm ($\pm 5/8$ in).
- Minimum length of the screw: thickness of the panel + thickness of balustrade system (sub-frame) - 5 mm ($\pm 3/16$ in).
- Sleeve diameter is 8 mm ($\pm 5/16$ in).
- Head diameter of the sleeve is 14 mm ($\pm 1/2$ in).
- Hole diameter in the panel for fixed point is 5.1 mm ($\pm 3/16$ in).
- Hole diameter in the panel for sliding point is 10 mm ($\pm 3/8$ in).
- To retain the panel position, each panel must have one fixed point in the centre of the panel. All other fixing points are sliding points.
- Screws must always be centered in the holes and must not be over tightened.
- Edge clearance must be at least 20 mm ($\pm 3/4$ in) to the center of the hole and maximum 20 x panel thickness.
- The maximum permissible panel length is 3050 mm (± 120 in).

Diameter of the hole	in the panel	in the subframe
Fixed point	5.1 mm ($\pm 3/16$ in)	8.5 mm ($\pm 5/16$ in)
Sliding point	10 mm ($\pm 3/8$ in)	8.5 mm ($\pm 5/16$ in)



Fixing with clamps

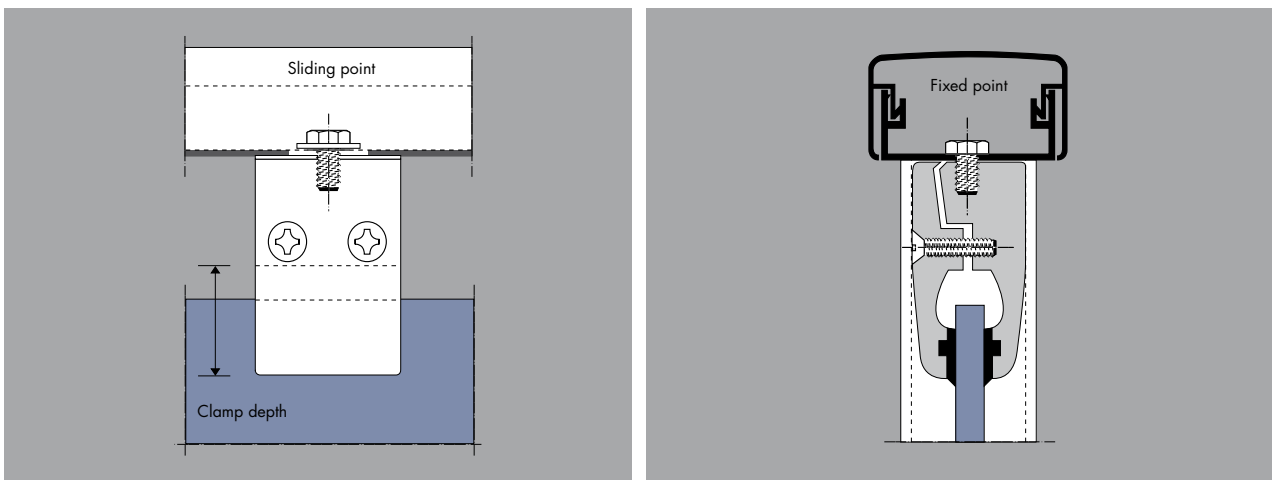
- Trespa® Meteon® panels with a minimum thickness of 8 mm ($\pm 5/16$ in) may be fixed using clamps.
- Clamps are screwed to the horizontal rails or vertical battens.
- If the clamps are fixed to vertical battens, each panel has to be secured to prevent it from sliding out of position, for example by means of lock pins.
- Minimum clamp depth 35 mm ($\pm 1\ 3/8$ in).
- Adjust the distance between the clamps depending on the panel thickness taking into account dimensional tolerances and fixed EPDM gaskets.
- Leave minimum 2.5 mm/m ($\pm 3/100$ in per foot) free space between the clamp and the edge of the panel.
- To retain the panel position, each panel must have one fixed point (hole diameter = screw diameter) in the centre of the panel. All other fixing points are sliding points.
- Sliding points are slotted holes in the section of the balustrade system.
- Edge clearance must be maximum 20 x panel thickness.

For suppliers of fixings, please contact your local Trespa representative.

Fixing using welded metal lugs

- Trespa® Meteon® panels with a minimum thickness of 8 mm ($\pm 5/16$ in) may be fixed using welded metal lugs.
- Metal lugs are welded to the horizontal rails or vertical battens.
- Leave minimum 2.5 mm/m ($\pm 3/100$ in per foot) free space at the edge of the panel.
- Shank diameter of the screw is 5 mm ($\pm 3/16$ in).
- Head diameter of the screw is 16 mm ($\pm 5/8$ in).
- Hole diameter in the panel for sliding point is 10 mm ($\pm 3/8$ in).
- To retain the panel position, each panel must have one fixed point (hole diameter = screw diameter) in the centre of the panel. All other fixing points are sliding points.
- Edge clearance must be at least 20 mm ($\pm 3/4$ in) to the center of the hole and maximum 20 x panel thickness.

For suppliers of fixings, please contact your local Trespa representative.



Maximum spans and fixing distances for panels only secured via fixing points on the edges

Panel thickness	Fixing	Fixing distance
6 mm (± 1/4 in)	Rivet Screw Clamp or welded metal lug	A = 450 mm (± 17 11/16 in) A = 450 mm (± 17 11/16 in) – L = 550 mm (± 21 5/8 in)
8 mm (± 5/16 in)	Rivet Screw Clamp or welded metal lug	A = 500 mm (± 19 11/16 in) A = 600 mm (± 23 5/8 in) A = 600 mm (± 23 5/8 in) L = 750 mm (± 29 1/2 in)
10 mm (± 3/8 in)	Rivet Screw Clamp or welded metal lug	A = 500 mm (± 19 11/16 in) A = 750 mm (± 29 1/2 in) A = 750 mm (± 29 1/2 in) L = 950 mm (± 37 3/8 in)
13 mm (± 1/2 in)	Rivet Screw Clamp or welded metal lug	A = 500 mm (± 19 11/16 in) A = 1000 mm (± 39 3/8 in) A = 1000 mm (± 39 3/8 in) L = 1250 mm (± 49 3/16 in)

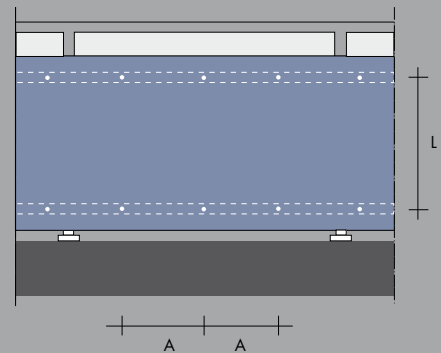
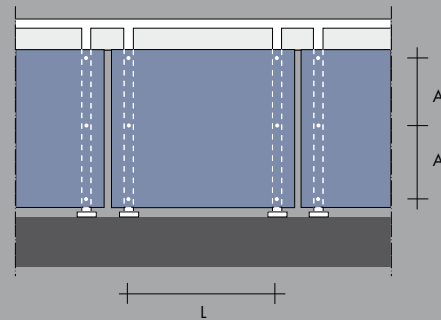
A = Screw / blind rivet / welded metal lug or clamp distance

L = Panel span; distance to the centre of the carrier profile
(or strip) to the centre of the carrier profile (or strip)

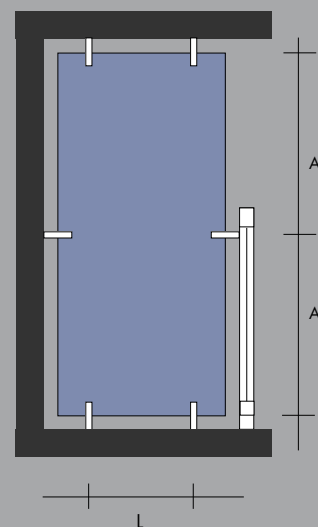
For aesthetical reasons we recommend decreasing the fixing centres and panel spans listed by 5 to 10% for building heights of over 8 meters (± 315 in). We recommend decreasing these values by 10 to 15% for building heights of over 20 meters (± 787 in) and that no 6 mm (± 1/4 in) panels are used in this case.

The various fixing and corresponding fixing distances for Trespa® Meteon® have been tested with the applicable additional loads and stresses in accordance with German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”).

Only secured on the edges



Clamps or welded metal lugs

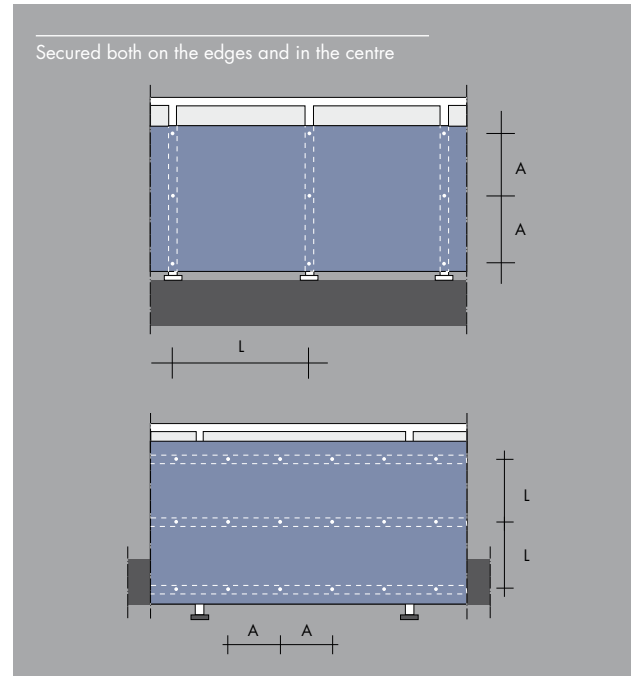


Maximum spans and fixing distances for panels secured via fixing points on the edges and in the centre

Panel thickness	Fixing	Fixing distance
6 mm (± 1/4 in)	Rivet Screw	A = 600 mm (± 23 5/8 in) A = 600 mm (± 23 5/8 in) L = 750 mm (± 29 1/2 in)
8 mm (± 5/16 in)	Rivet Screw	A = 600 mm (± 23 5/8 in) A = 800 mm (± 31 1/2 in) L = 950 mm (± 37 3/8 in)
10 mm (± 3/8 in)	Rivet Screw	A = 600 mm (± 23 5/8 in) A = 1200 mm (± 47 1/4 in) L = 1200 mm (± 47 1/4 in)
13 mm (± 1/2 in)	Rivet Screw	A = 600 mm (± 23 5/8 in) A = 1500 mm (± 59 1/16 in) L = 1500 mm (± 59 1/16 in)

A = Screw/rivet distance

L = Panel span; distance from the centre of the carrier profile
(or strip) to the centre of the carrier profile (or strip)



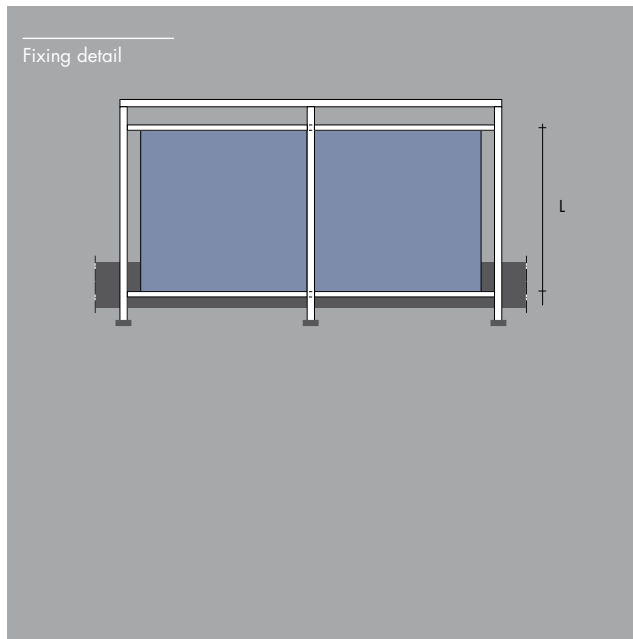
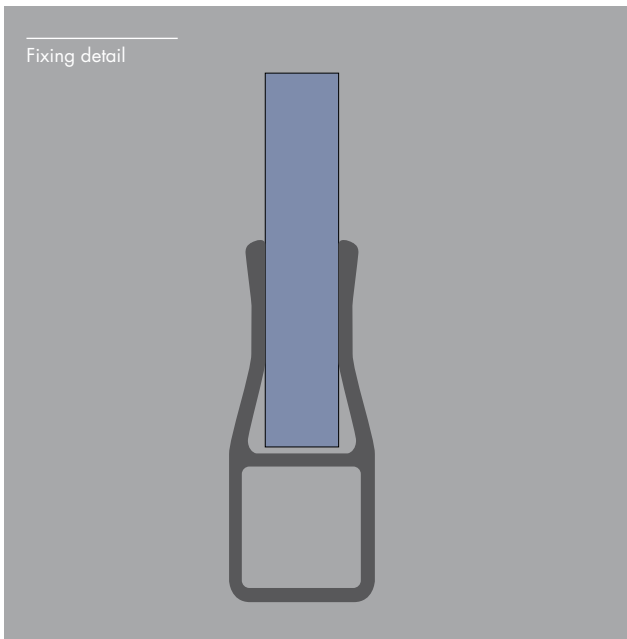
For aesthetical reasons we recommend decreasing the fixing centres and panel spans listed by 5 to 10% for building heights of over 8 meters (± 315 in). We recommend decreasing these values by 10 to 15% for building heights of over 20 meters (± 787 in) and that no 6 mm (± 1/4 in) panels are used in this case.

The various fixing and corresponding fixing distances for Trespa® Meteon® have been tested with the applicable additional loads and stresses in accordance with German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”).

Fixing with profiles

- Trespa® Meteon® panels with a minimum thickness of 6 mm (± 1/4 in) may be fixed with profiles on two or four panel sides. Permissible panel thickness is depending on the building height.
- The profiles must offer static bearing support in a longitudinal direction.
- The profile dimensions must be adjusted to the panel thickness, taking into account dimensional tolerances and fixed EPDM gaskets.
- Depth of the groove in the panel must be minimum 20 mm (± 3/4 in).
- Keep the edges of the panel at least 6 mm (± 1/4 in) free from the profiles on three sides, to allow for free panel movement.
- Ensure drainage by:
 - fitting slotted holes of 5 x 25 mm (± 3/16 in x 1 in) or drilling holes of 8 mm (± 5/16 in) in the lower horizontal rail.
 - installing two supports (minimum 5 x 50 mm (± 3/16 in x 2 in)) in the lower profile for every panel.
- For aesthetical reasons Trespa recommend to use a metal H-section where two panels meet.

For suppliers of fixings, please contact your local Trespa representative.



Maximum panel spans and fixing distances for panels fixed on two sides

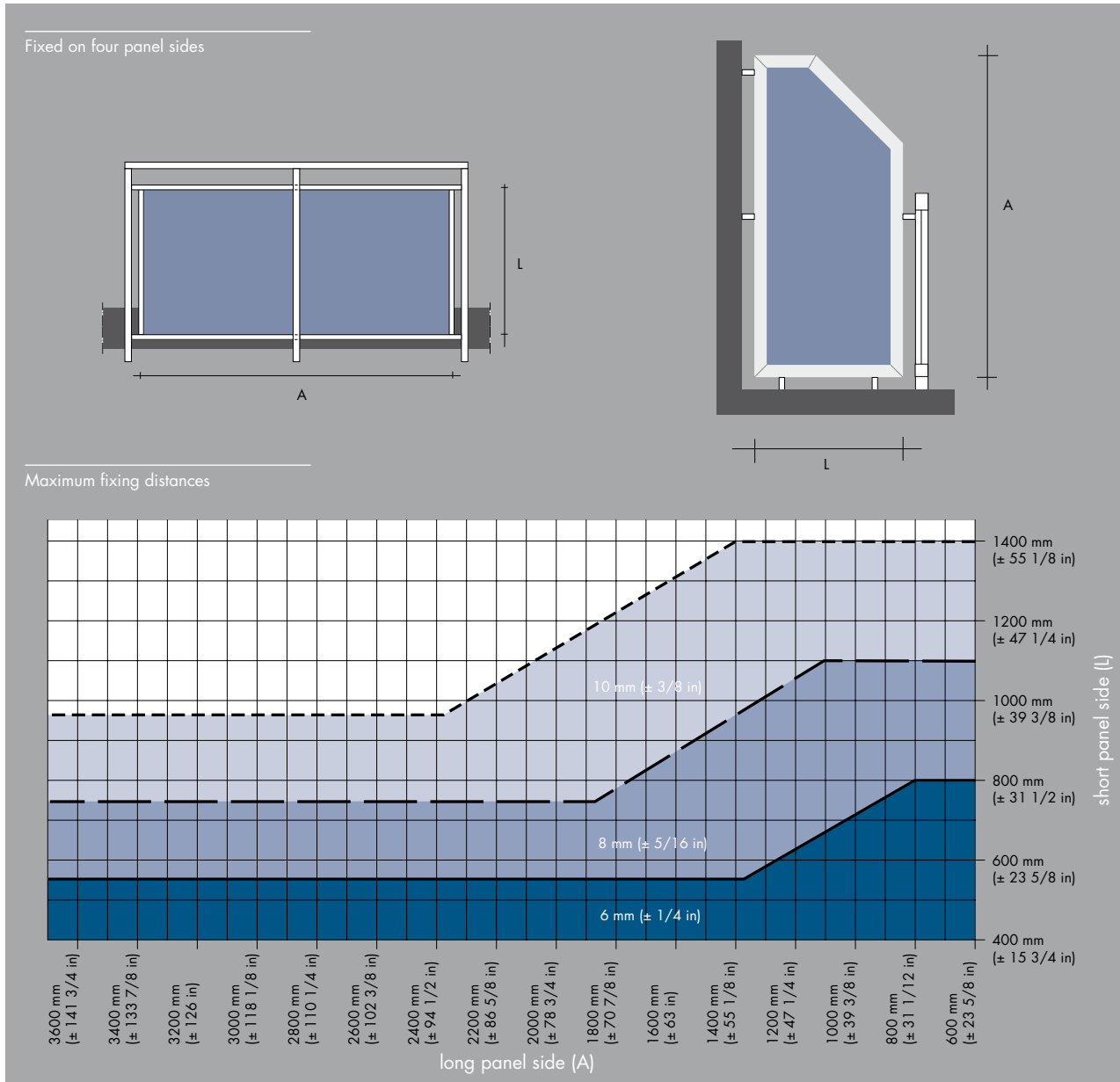
Panel thickness	Span L
6 mm (± 1/4 in)	550 mm (± 21 5/8 in)
8 mm (± 5/16 in)	750 mm (± 29 1/2 in)
10 mm (± 3/8 in)	950 mm (± 37 3/8 in)

L = Maximum panel span in mm

For aesthetical reasons we recommend decreasing the fixing centres and panel spans listed by 5 to 10% for building heights of over 8 meters (± 315 in). We recommend decreasing these values by 10 to 15% for building heights of over 20 meters (± 787 in) and that no 6 mm (± 1/4 in) panels are used in this case.

The various fixing and corresponding fixing distances for Trespa® Meteon® have been tested with the applicable additional loads and stresses in accordance with German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”).

Maximum spans and fixing distances for panels fixed on four sides



L = always the short panel side

A = always the long panel side

For aesthetical reasons we recommend decreasing the fixing centres and panel spans listed by 5 to 10% for building heights of over 8 meters (± 315 in). We recommend decreasing these values by 10 to 15% for building heights of over 20 meters (± 787 in) and that no 6 mm (± 1/4 in) panels are used in this case.

The various fixing and corresponding fixing distances for Trespa® Meteon® have been tested with the applicable additional loads and stresses in accordance with German ETB guideline “Building components that protect against falling” (“Bauteile, die gegen Absturz sichern”).

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