

# TECHNICAL FILE

EVO®  
On steel deck

EN ISO 14122-3 : 2017  
NF E85-015 : 2019



DELTAPLUS



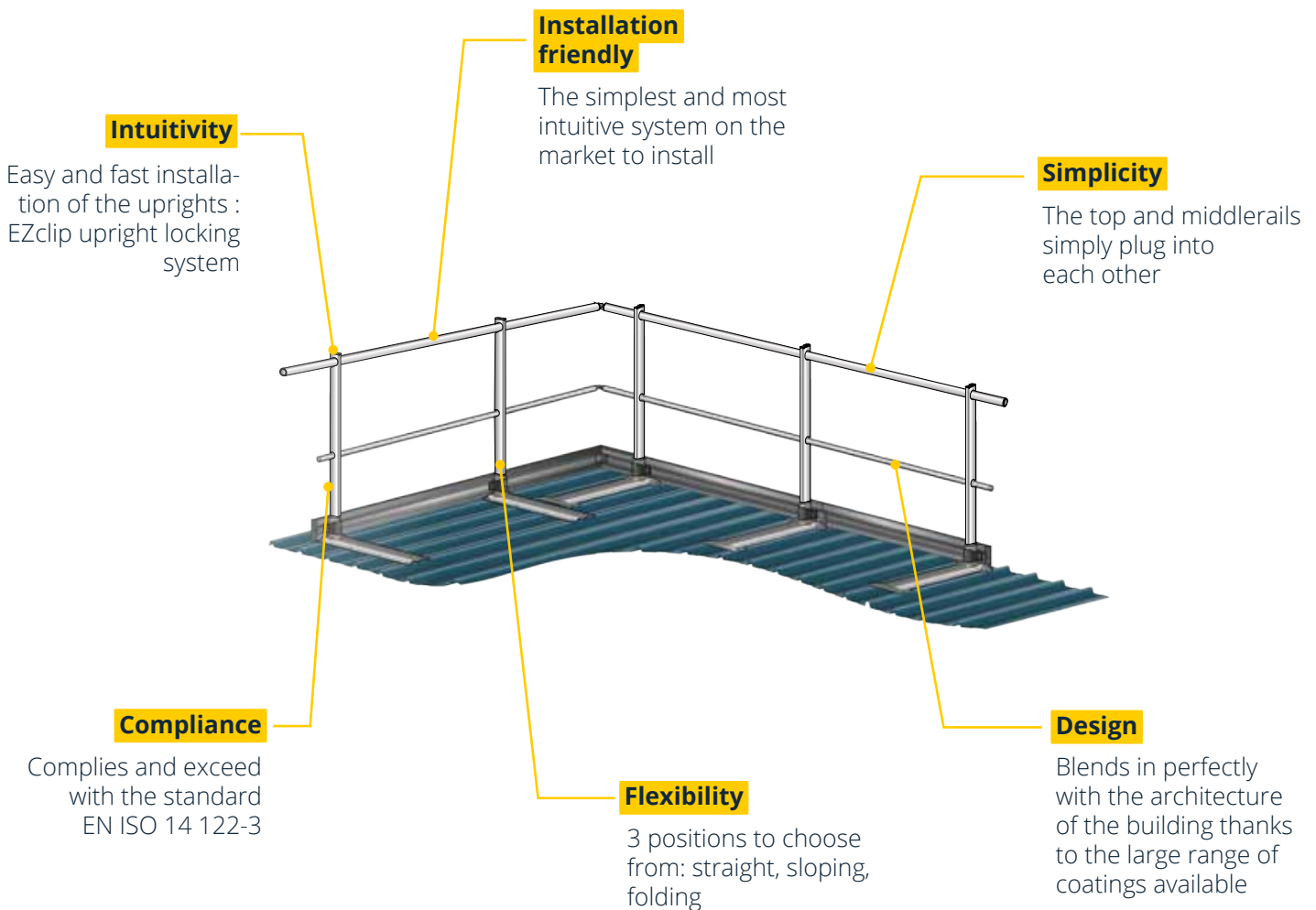
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## Guardrail on steel deck

**EVO®**

### PRODUCT PRESENTATION

The EVO® guardrail on steel deck is a collective fall protection system designed to protect roof terraces not accessible to the public. It is the perfect solution to secure steel deck roofs without cutting or re-sealing (wave spans between 250 and 333mm with minimum deck thickness of 63/100th - other dimensions upon request).





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## Guardrail on steel deck

**EVO®**

### STANDARDS

- A guardrail must be installed as soon as the possible height of fall is higher than 500 mm.
- The guardrail handrail height must be comprising between 1000 and 1100 mm above the walking area.
- The distance between the handrail and kneerail, as well as between the kneerail and the toeboard must be less than or equal to 500 mm.

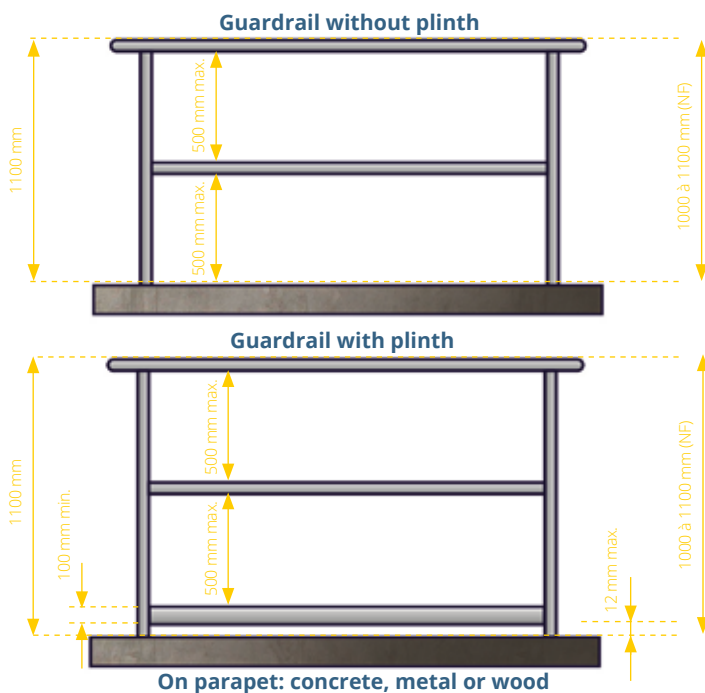
- This space shall be reduced to a maximum of 340 mm between the rail and the middlerail and between the middlerail and the toeboard when the guardrail is installed at the bottom of a slope greater than 15°.

- A toeboard of 100 mm height minimum must be installed at 12 mm maximum from the walking area and the side of the platform.

- The distance between the axes of the uprights should be limited to a maximum of 1500 mm. However, if this distance is greater, particular attention should be paid to the strength of the anchoring of the uprights and fixing devices: consult our design office.

- If the handrail is interrupted, the free space between two segments of the handrail should be between 75 mm and 120 mm. If there is a larger opening, a gate to ensure the continuity of the fall protection of the guardrail must be installed.

- Folding: A lifeline must be installed before the folding guardrail is fitted. This will also be used during installation and handling.

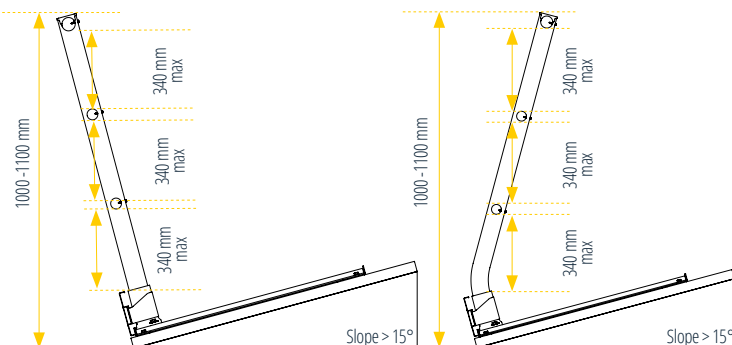


### REGULATION

The EVO® guardrail for steel deck complies with the standard EN ISO 14122-3 of March 2017, machines safety - permanent access means to machines – part 3: staircases, step ladders, guardrails – Permanent means of access.

The EVO® guardrail for steel deck to be sealed passed with success the static and dynamic tests required by the standards EN ISO 14122-3 and NF E85-015.

NF : French Standard NF E85-015 / EN : European Standard EN ISO 14122-3



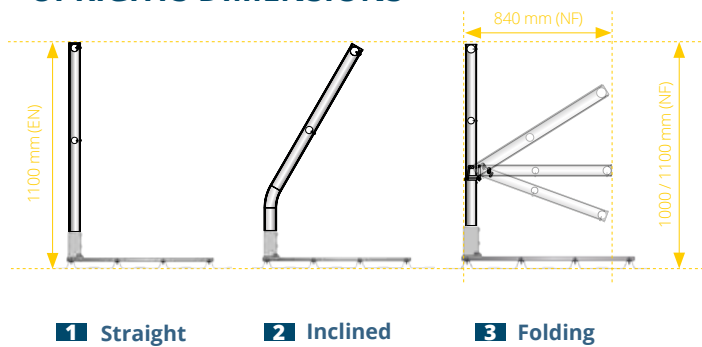


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## Guardrail on steel deck

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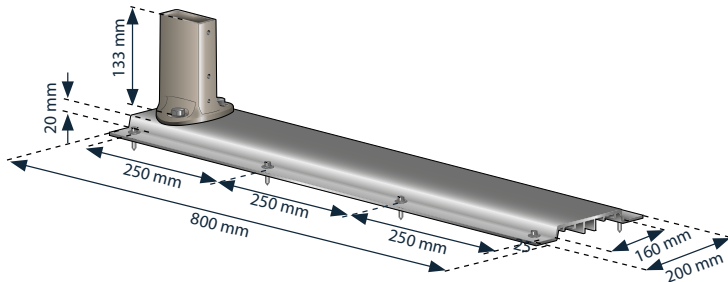
### UPRIGHTS DIMENSIONS



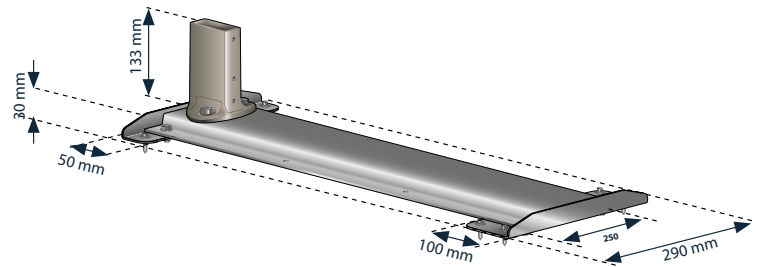
### FIXING BRACKETS DIMENSIONS (in mm)

For steel deck with 250 mm-wave-spans

250 mm wave fixing base for steel deck with railing parallel to the pan (fixing screws not included)

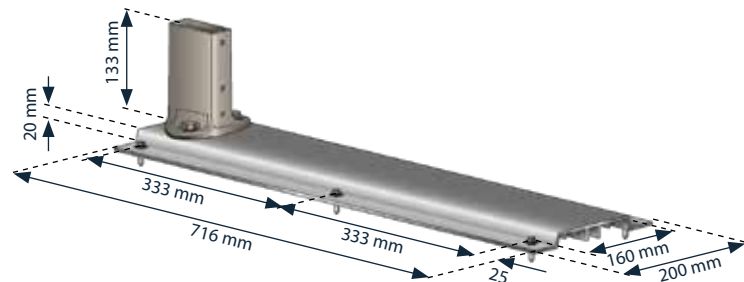


250 mm wave fixing base for steel deck with railing perpendicular to the pan (fixing screws not included)

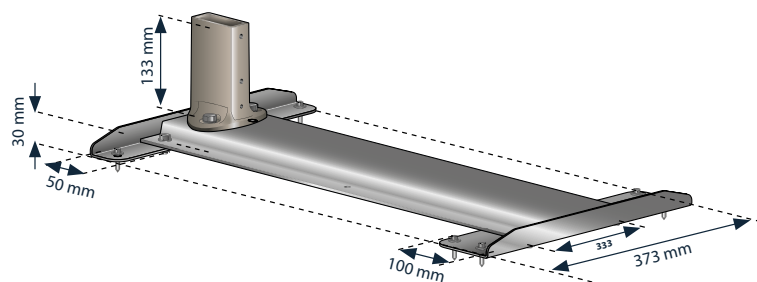


For steel deck with 333 mm-wave-spans

333 mm wave fixing base for steel deck with railing parallel to the pan (fixing screws not included)



333 mm wave fixing base for steel deck with railing perpendicular to the pan (fixing screws not included)





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# Guardrail on steel deck



## USE & MAINTENANCE INSTRUCTIONS

- The person performing the installation of EVO® guardrail must be a qualified person and must observe the common rules on working at heights. It must thus ensure his own security (use of a temporary lifeline, PPE, aerial lift, etc)
- Before any use, user must ensure by visual inspection that EVO® guardrail shows no anomaly (shock, distortion, etc.)
- The EVO® guardrail does not require any particular maintenance, however, a visual inspection must be carried out at least once a year by a qualified person
- If the guardrail EVO® is improperly installed, damaged or has been used to arrest a fall, its use must be stopped immediately and it must not be used until a qualified person has authorized in writing its reuse after examination and verification
- If the product is sold outside the first country of destination, it is essential for the safety of the user that the reseller provides the instructions of use in the language of the country of the product use. These documents can be provided upon request by contacting the manufacturer
- EVO® guardrail is a mean of permanent collective protection which must be used by professionals on flat roofs not accessible to the public.

- The use of a EVO® toeboard is mandatory if the terrace does not have any parapet or if it is less than 100 mm height.
- If EVO® guardrail is installed in a polluted industrial environment, petrochemical, maritime or on seaside, it is compulsory to make a surface treatment appropriated type powder coating, anodizing, etc.
- Each straight section must have a minimum of 3 uprights
- To ensure compliance, the installation must be carried out according to a layout plan produced by our configurator or our design office.

## STORAGE

Raw aluminum components are packaged in contact with each other. The action of the rain on the unopened package will facilitate the oxidation of these components. Surface stains may occur. They do not degrade the quality of aluminum but can spoil the appearance of the railings.

We recommend you to unpack the package and to store the components separated from each other (no contact between them), or to store the packages still packed in a dry place.

## FIXING PRINCIPLE

The fixing of the guardrail on metal deck to be sealed is realized with the self-drilling screw 6x25.

Contrary to a standard self-drilling screw, where the drilling waste is evacuated as shavings, the self-drilling screw pushes the material back to the inside by shaping a bulge, which increases the implementation length. The tightening torque of the selfdrilling screw 6x25 is high even in small thicknesses (> 5 N.m for an average of 1.5 N.m for standard self-drilling screws).

Assembly resistance characteristics of the self-drilling screw 6x25	Tôle matière S320 Épaisseur 0.63mm	Tôle matière S320 Épaisseur 0.75mm
Shear load PK value with 1 selfdrilling screw 6x25 (in DaN)	219	286
Pull-out PK value with 1 selfdrilling screw 6x25 (in DaN)	142	187
Ultimate pull-out PK value with 1 selfdrilling screw 6x25 (in DaN)	721	921



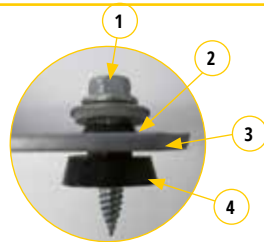
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## Guardrail on steel deck

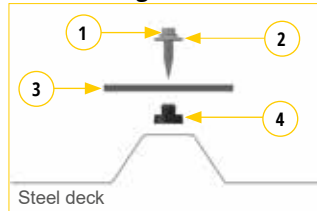
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### FIXING PRINCIPLE

- 1: Self-drilling screw 6x25
- 2: Waterproof washer
- 3: Fixing plate
- 4: Waterproof flue washer



Before fixing



After fixing



Wave spans	Guardrail configurations	Quantities
250 mm	Parallel to the deck	8
	Perpendicular to the deck	6
333 mm	Parallel to the deck	
	Perpendicular to the deck	

### OPTIONS

#### For an optimum fixing on metal deck: The torque limiter DB CONTROL 5N.M

We recommend you to use this torque limiter to avoid damages on the screw. Specifically adapted to the tightening torque of 5 N.m, which characterizes the selfdrilling screw 6x25, the fixing on metal deck is performed serenely.

By respecting the operating mode torque limiter + self-drilling screw 6x25 with waterproof washer and bowl washer, the watertightness is optimized and the mounting is quick and simple:

- 1 rivet = 3 operations (drilling, waterproofing and seaming)
- 1 self-drilling screw = 1 screwing operation.

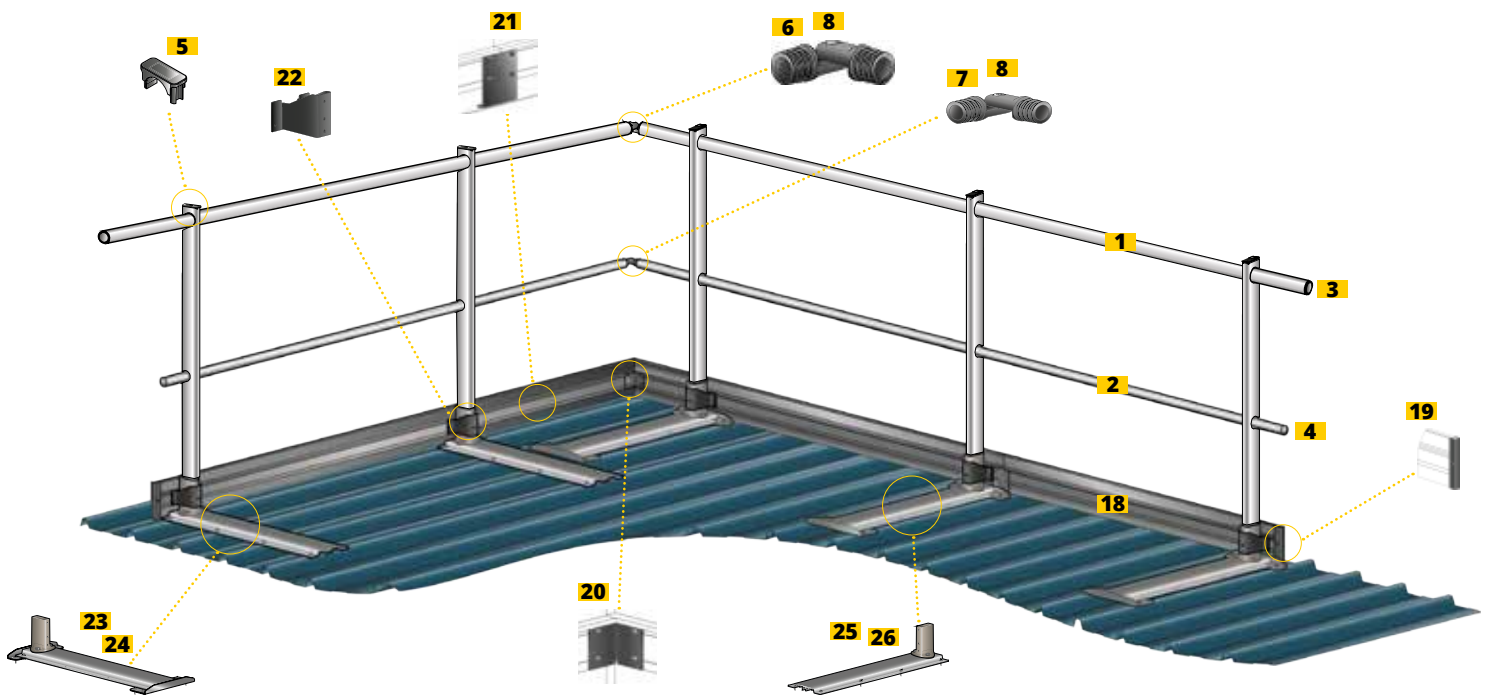




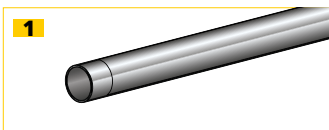
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## Guardrail on steel deck - wave spans: 250mm

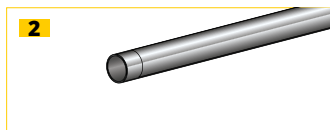
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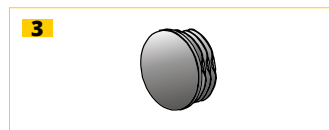
### GENERAL COMPONENTS



**1**  
Shrunken rail Ø45 mm  
WV830450  
Lenght 3000 mm



**2**  
Shrunken middle-rail Ø35 mm  
WV830350  
Lenght 3000 mm



**3**  
Rail cap Ø45 mm  
WV830451



**4**  
Middle-rail cap Ø35 mm  
WV830351



**5**  
EZclip plastic cap  
WV820000



**6**  
Rail angle Ø45 mm  
WV830450



**7**  
Middle-rail angle Ø35 mm  
WV830352



**8**  
Aluminium middle-rail angle Ø35 and 45 mm - WV830453



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## Guardrail on steel deck

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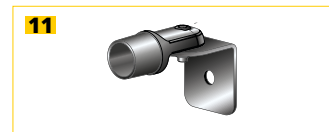
### GENERAL COMPONENTS



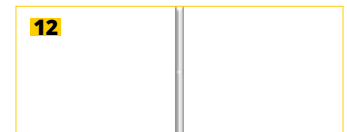
**9**  
Wall fixing bracket  
for rail Ø45 mm - WW830454



**10**  
Wall fixing bracket  
for middle-rail Ø35 mm  
WW830354



**11**  
Wall fixing aluminium bracket  
for rail and middle-rail  
WW830455



**12**  
Straight upright  
H : 1010 mm  
WW8201010



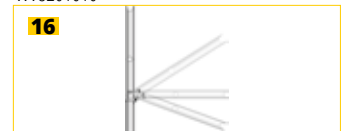
**13**  
Straight upright  
H : 1105 mm  
WW8201105



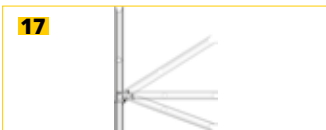
**14**  
Inclined upright  
H : 1005 mm  
WW8201005C



**15**  
Inclined upright  
H : 1165 mm  
WW8201165C



**16**  
Folding upright  
H : 1010 mm - articulation alu  
WW8201010F



**17**  
Folding upright  
H : 1105 mm - articulation alu  
WW8201105F



**18**  
Toeboard  
L : 3000 x 150 x 9 mm  
WW840000



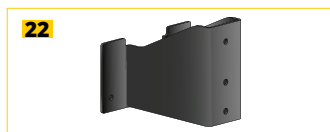
**19**  
Toeboard cap  
H : 150 mm  
WW840001



**20**  
Angle toeboard kit (inside/out-  
side)  
H : 150 mm  
WW840003

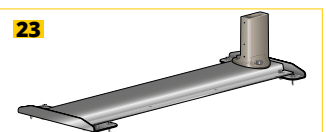


**21**  
Toeboard straight connector  
H : 150 mm  
WW840005

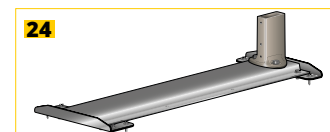


**22**  
Toeboard bracket support for  
flat-fixing-guardrail  
WW841001

### NOMENCLATURE: SUPPORT BASES



**23**  
Guardrail basis for perpendicu-  
lar steel deck - 250 mm  
(steel deck fixing not included)  
WW815011



**24**  
Guardrail basis for perpendicu-  
lar steel deck - 333 mm  
(steel deck fixing not included)  
WW815021



**25**  
Guardrail basis for parallel  
steel deck - 250 mm  
(steel deck fixing not included)  
WW815010



**26**  
Guardrail basis for parallel  
steel deck - 333 mm  
(steel deck fixing not included)  
WW815020





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## Guardrail on steel deck - wave spans: 250mm

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### NOMENCLATURE: FIXINGS

**27**



Stainless steel self-drilling screw 4.8x16 TH - ZOSYSBVHF48016

**28**



Stainless steel self-drilling screw 4.8x25 TH - ZOSYSBVHF48025

**29**



6x25 self-drilling screw  
With sealed washers - ZOSYSBVHF06025

**30**



Chimney washer  
ZOSYSBRC001

**31**



STHC M08x10i DINI913 Screw  
ZOSYSBVI5ST002

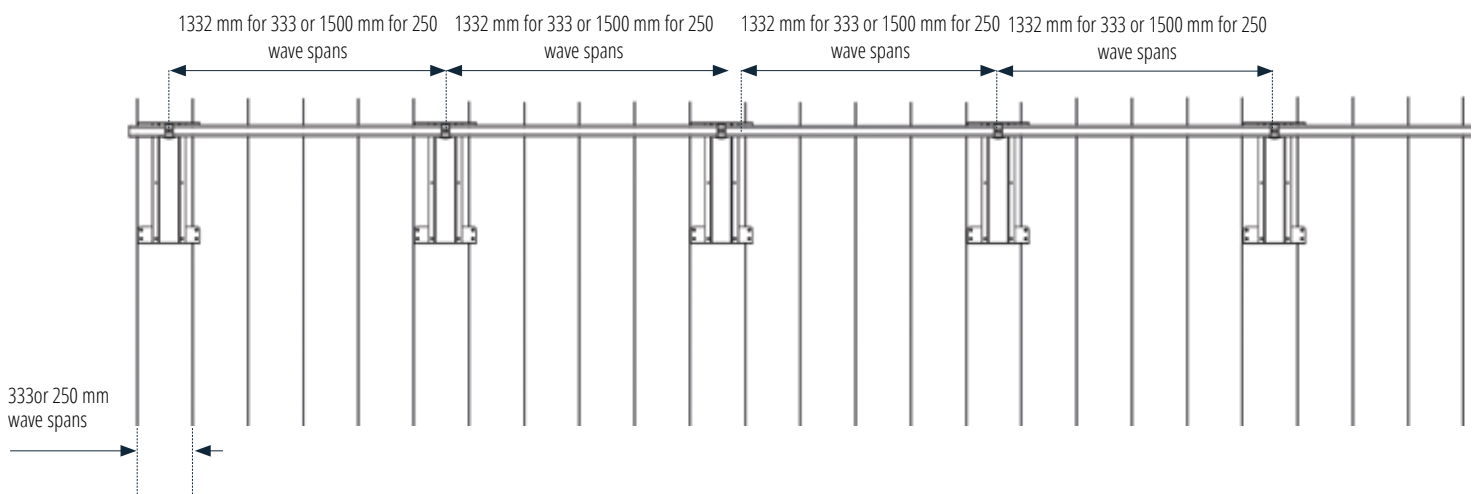
**32**



Torque limiter  
DB CONTROL 5N.M

### EXAMPLES OF LAYOUTS

#### Straight position



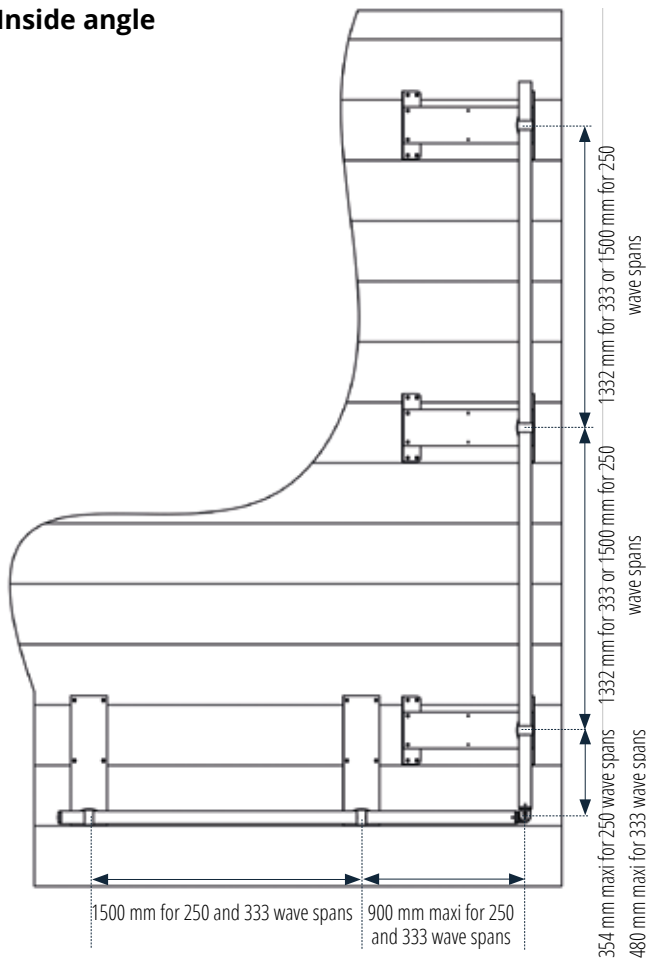


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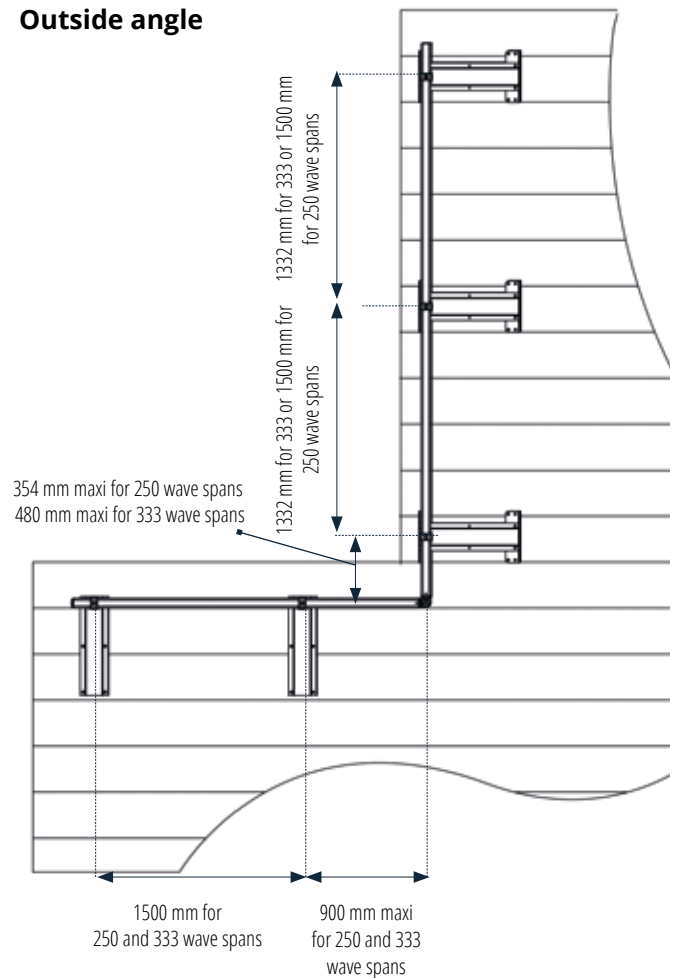
## Guardrail on steel deck

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Inside angle



Outside angle





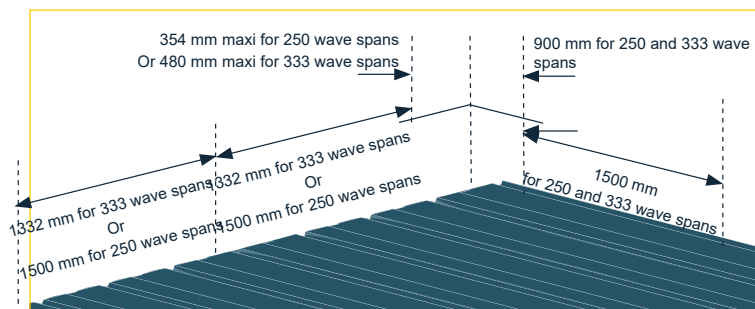
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## Guardrail on steel deck

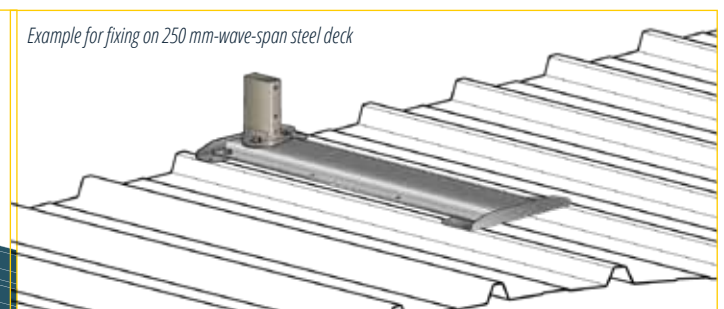
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### INSTALLATION

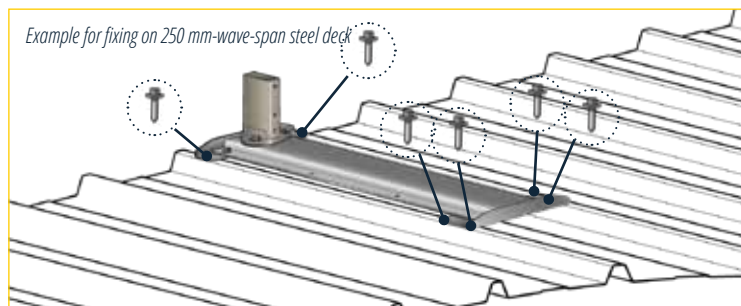
The installation of EVO® guardrail must be done by a minimum of two people. It is recommended to start installation in an angle



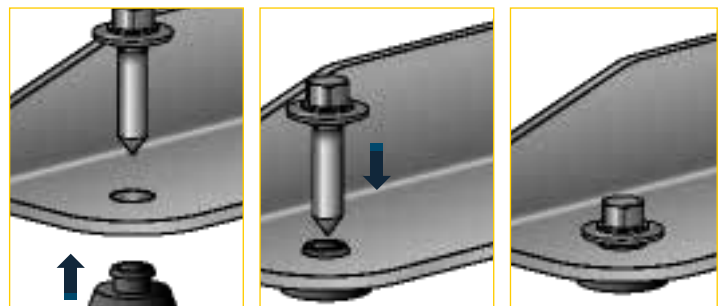
1 - Draw marks using a guiding line to install fixing bases.



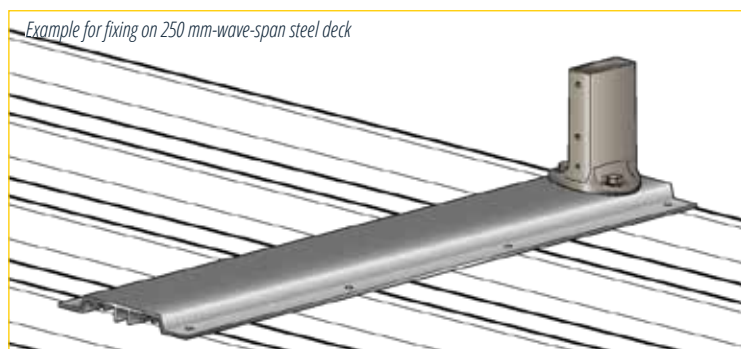
2 - Place the 250 mm or 333 mm wave base for steel sheets perpendicular to the deck.



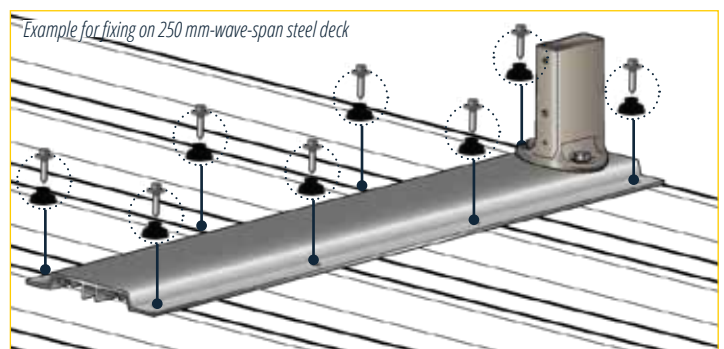
3 - The 250 mm and 333 mm mounting base plates for guardrail on metal decks perpendicular to the waves are fixed with 6 selfdrilling screw 6x25 screws with their sealing bowl washers.



4 - Slide the sealing bowl washer into the hole underneath the mounting base plate, then screw the selfdrilling screw 6x25 fully against the washer so that the fastener is completely watertight. We recommend using the DB CONTROL 5N.m torque limiter (see nomenclature) to ensure your fastenings.



5 - Place the 250 mm or 333 mm wave base for steel sheets parallel to the deck.



6 - Warning: the 250 mm mounting base plate is fixed with 8 selfdrilling screw 6x25 (+ bowl washers) while the 333 mm mounting base plate is fixed with 6 selfdrilling screw 6x25.

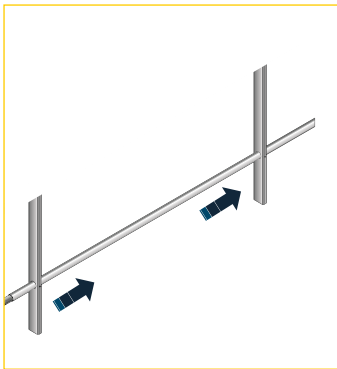


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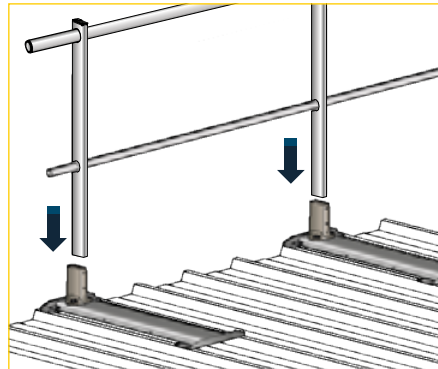
## Guardrail on steel deck

**EVO®**

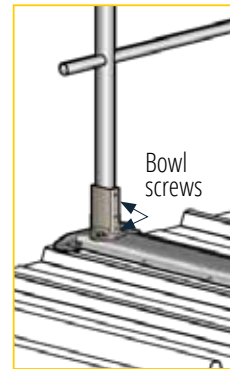
### INSTALLATION



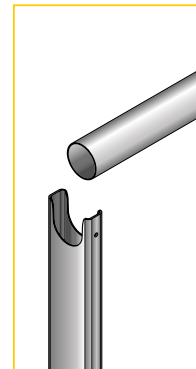
7 - Insert a middlerail through 2 uprights



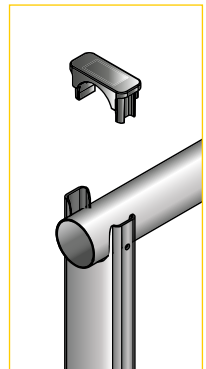
8 - Insert the set into the fixing supports



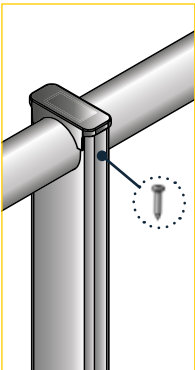
9 - Screw in the bowl screws of the flat bases



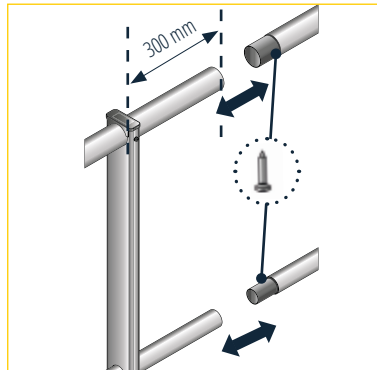
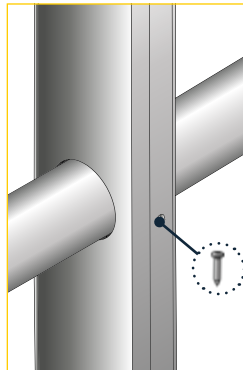
10 - Put the rail on the uprights



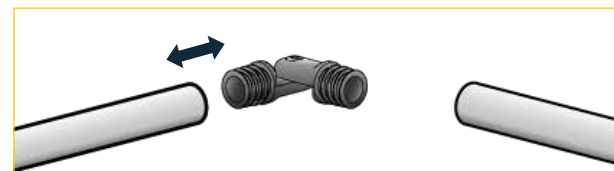
11 - Clip EZclip to the top of the upright



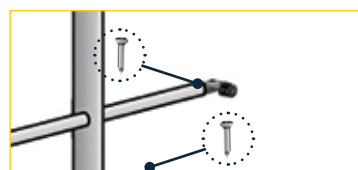
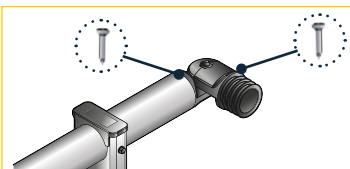
12 - Tighten self-drilling screws 4,8 x 25 on upright, where rail and middlerail are positioned



13 - Once the guardrail is mounted, tighten the selfdrilling screws 4,8x16.



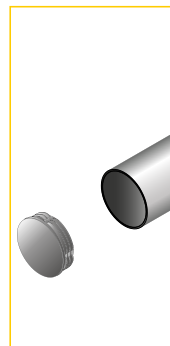
14 - Clip rail and middlerail angles



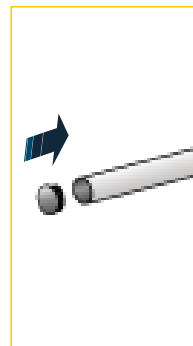
15 - Tighten angles with self-drilling screws 4,8 x 25



16 - Adjust last section by sawing swagged extra



17 - Clip caps and wall brackets to rails and middlerails



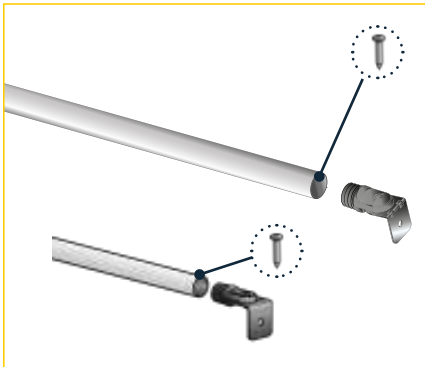


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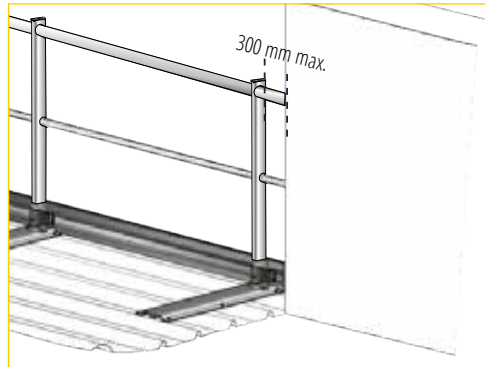
## Guardrail on steel deck

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### INSTALLATION: WALL BRACKETS

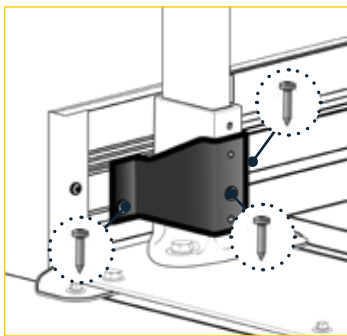


1 - Fix wall brackets using self-drilling 4.8 x 25 screws

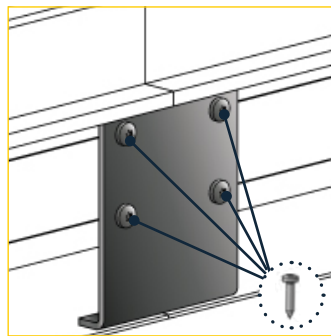


2 - Observe the maximum distance of 300 mm between the upright and the wall

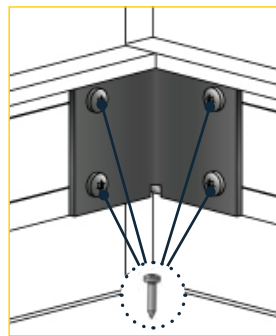
### INSTALLATION: TOEBOARD



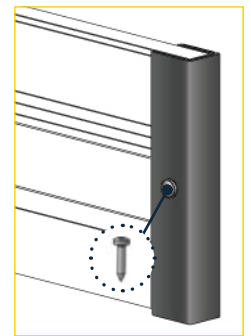
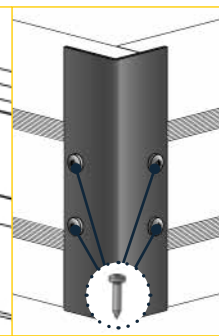
1 - Place the toeboard support on the base and secure it with 4 self-drilling screws TH 4.8 x 16 (1 screw on each side)



2 - Attach the toeboard lengths between them through the toeboard connectors and 4 selfdrilling screws TH 4.8 x 16



3 - For angles, secure the inner and external connectors with 8 self-drilling screws TH 4.8 x 16



4 - Finally, fix the toeboard plugs with one self-drilling screw TH 4.8 x 16