

BORDER M

SAFETY REGULATIONS, INSTRUCTIONS
FOR INSTALLATION AND USE



Fe: min 0,4 mm
Al: min 0,7 mm



Fe: min 0,4 mm
Al: min 0,7 mm



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NORME DI SICUREZZA, ISTRUZIONI DI UTILIZZO E INSTALLAZIONE

INTRODUZIONE

DEFINIZIONE

Il parapetto **BORDER M** è un sistema di protezione collettiva anticaduta, ideale per la sicurezza dei tetti, realizzato in lega di alluminio (**EN AW 6005A-T6 e EN AW 6063-T6**), installabile su coperture con pendenza fino a 10°.

NORME

Il parapetto a fissaggio orizzontale **BORDER M** è conforme alle seguenti normative:

- **EN 14122-3:2016**
- **EN 13374:2025 Cl.A (eccetto punto 9)**
- **EN 13374:2013+A1:2018 Cl.A (eccetto punto 9)**
- **NF E85-015:2019 (Francia)**
- **DGUV 201-056 (Germania)**
- **OSHA 1910.29 (USA)**

La tabella di seguito riassume i principali parametri geometrici previsti da ciascuna normativa:

	EN 14122-3: 2016	EN 13374: 2025 EN 13374: 2013 +A1: 2018 CL.A	NF E85-015: 2019	OSHA 1910.29
Min. altezza dal piano di calpestio	1,1 m	1 m	1 - 1,1 m	0,99 - 1,14 m (39 - 45 in)
Max. interasse tra i correnti	500 mm	470 mm	500 mm	480 mm
Max. interasse tra i montanti	1,5 m (suggerito)	-	1,5 m (suggerito)	-
Min. altezza tavola fermapiede	10 cm	15 cm	10 cm	-

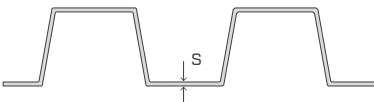
USO - MANUTENZIONE

- Prima dell'uso, assicurarsi tramite controllo visivo che il parapetto **BORDER** non presenti nessuna anomalia (urti, deformazioni, ecc.).
- Il parapetto **BORDER** non richiede una manutenzione particolare, tuttavia è necessario che un operatore qualificato esegua un controllo visivo almeno una volta all'anno.
- Se il parapetto **BORDER** è installato in modo improprio, danneggiato o è stato utilizzato per fermare una caduta, il suo utilizzo deve essere immediatamente interrotto. Non deve essere riutilizzato fino all'autorizzazione scritta di un operatore qualificato, a seguito di ispezione e verifica.
- Se il prodotto è rivenduto al di fuori del Paese di destinazione, è essenziale che il rivenditore fornisca il manuale di istruzioni nella lingua del Paese in cui il prodotto viene utilizzato. Questi documenti possono essere forniti su richiesta contattando il produttore.
- Il parapetto **BORDER** è un dispositivo di protezione collettiva permanente che deve essere utilizzato esclusivamente dai professionisti sulle coperture non accessibili al pubblico.
- Se installato in un ambiente industriale inquinato, petrolchimico, navale o costiero, il parapetto **BORDER** deve essere sottoposto a un trattamento superficiale adeguato come verniciatura a polvere, anodizzazione, ecc.
- Se necessario, si consiglia di collegare il parapetto a un sistema di protezione antifulmini secondo le normative locali. Non utilizzare come linea di messa a terra del parafulmine.
- Se è stata fornita una planimetria, fare riferimento a questo documento durante l'installazione.

STOCCAGGIO

I componenti in alluminio grezzo sono imballati a contatto tra loro. L'azione della pioggia, sulla confezione chiusa, può favorire l'ossidazione di questi componenti. In questo caso, possono apparire delle macchie superficiali. Queste non compromettono la qualità dell'alluminio, ma possono danneggiare l'aspetto estetico del parapetto. Si consiglia di disimballare la confezione e mantenere i componenti separati tra loro (nessun contatto tra di essi), o di conservare le confezioni ancora imballate in un luogo asciutto.

SOTTOSTRUTTURE E FISSAGGI

REQUISITO MINIMO	MATERIALE	S _{min}
	ACCIAIO	0,4 mm
	ALLUMINIO	0,7 mm

PRINCIPALI FORZE AGENTI SUI RIVETTI

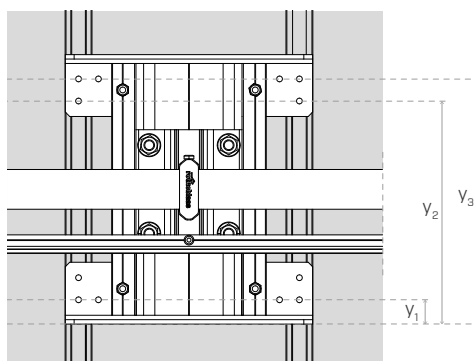
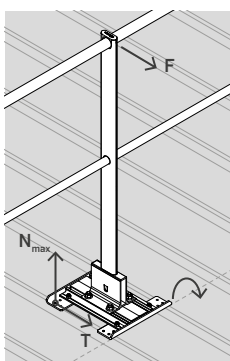
Le forze agenti sul rivetto (trazione e taglio) sono determinate assumendo le seguenti ipotesi:

- flangia rigida e distribuzione lineare degli sforzi
- braccio dell'azione pari alla lunghezza del montante (caso peggiore H = 110 cm)
- punto di rotazione per la scomposizione del momento corrispondente col bordo della flangia
- interasse massimo e forza puntuale massima sulla sommità del montante per la normativa applicabile.

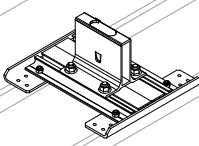
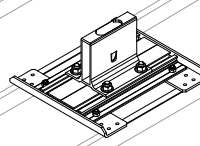
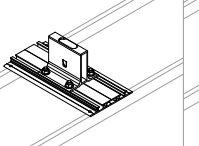
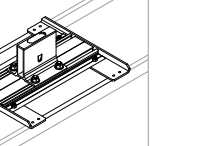
I valori di seguito riportati si riferiscono alla sollecitazione del j-esimo rivetto della fila maggiormente sollecitata rispetto all'asse di rotazione.

$$T = \frac{F}{N_{riv}}$$

$$N = \frac{M_f}{\sum_{j=1}^m n_j \cdot y_j^2} \cdot y_j$$



La fila maggiormente sollecitata è quella relativa all'asse y₃.

		BORBASEM250	BORBASEM250	BORBASEM333PA	BORBASEM333PE
					
T [N]	EN 14122-3: 2016 DGUV 201-056*	131,3	131,3	131,3	116,4
N _{max} [N]		515,2	515,2	398,2	371,4
T [N]	EN 13374: 2025 DGUV 201-056*	91,7	91,7	91,7	91,7
N _{max} [N]		359,8	359,8	278,1	292,5
T [N]	NF E85-015: 2019	154,7	154,7	154,7	137,2
N _{max} [N]		607,2	607,2	469,3	437,7
T [N]	OSHA 1910.29	148,3	148,3	148,3	148,3
N _{max} [N]		582,3	582,3	450,0	473,3

* DGUV 201-056: disponibile sia in configurazione di parapetto permanente (EN 14122) sia di parapetto temporaneo (EN 13374).

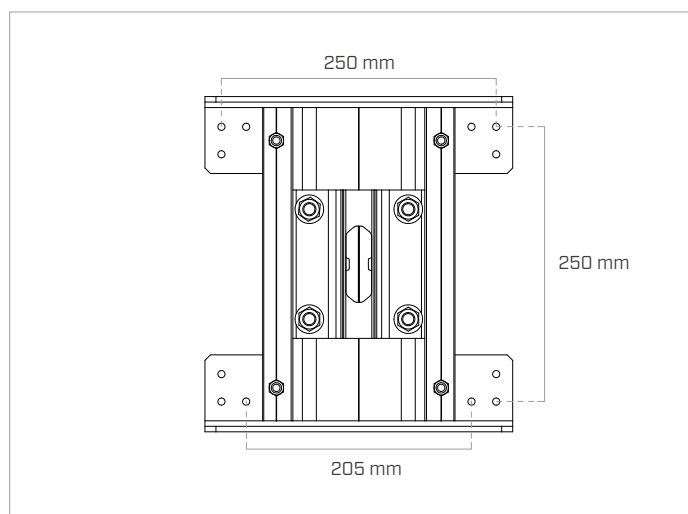
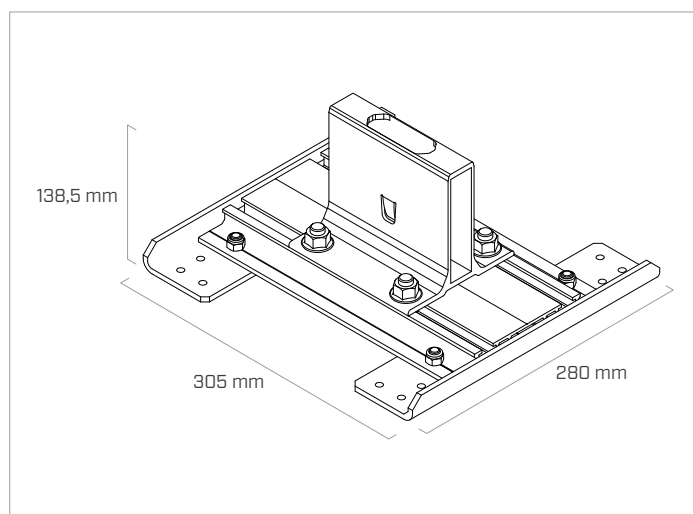
ATTREZZATURA



TIPOLOGIA DI BASI

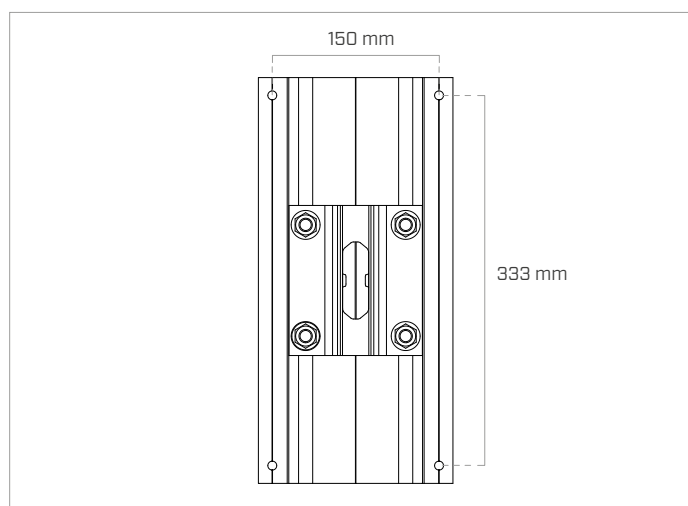
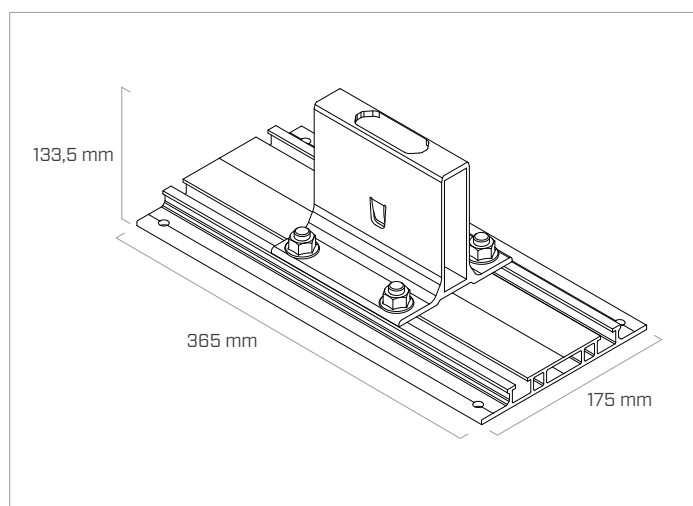
BORBASEM250

Base universale su lamiera trapezoidale in direzione parallela e perpendicolare alle greche. Adattabile a interasse greche 250 mm.



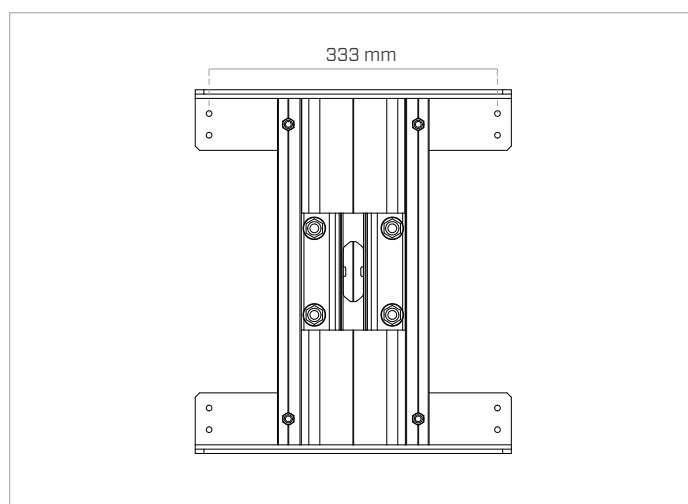
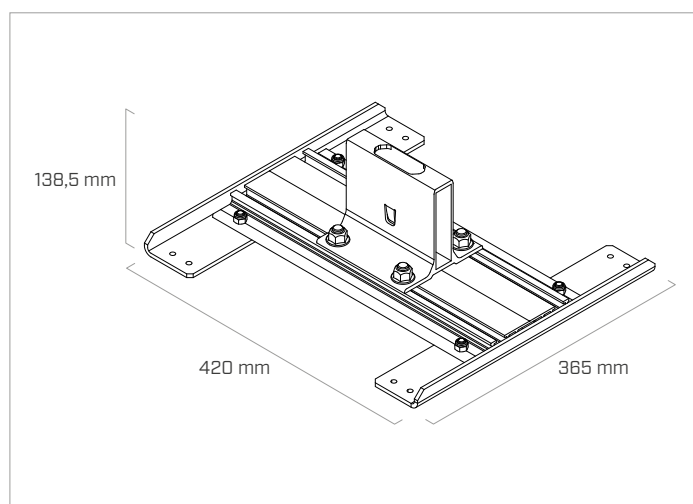
BORBASEM333PA

Base su lamiera trapezoidale in direzione parallela alle greche. Adattabile a interasse greche 333 mm.



BORBASEM333PE

Base su lamiera trapezoidale in direzione perpendicolare alle greche. Adattabile a interasse greche 333 mm.



FISSAGGIO E INSTALLAZIONE DELLE BASI

Il parapetto su lamiere grecate è fissato tramite rivetti RIV6320 (Ø 6.3 x 20 mm – ETA-25/1169), con rondelle di tenuta integrate e nastro monoadesivo EPDM253 (25 x 3 mm, rotolo da 20 m) per garantire l'impermeabilizzazione del gruppo di fissaggio alla sottostruttura metallica.



TOOL PER IL FISSAGGIO:
Rivettatrice a batteria

PRIMA DEL FISSAGGIO	DOPO IL FISSAGGIO
Rivetto RIV6320	
Piastra base M	
Nastro monoadesivo EPDM253	
Lamiera trapezoidale	

SPECIFICHE DI INSTALLAZIONE

Tabella 1

montante	tipologia montante	H _{montanti}
BORUP100/R	dritto e curvo	100 cm
BORUP110/R		110 cm
BORUP113C		110 cm
BORUP100F	ribaltabile	100 cm
BORUP110F/R		110 cm
BORUP107US	dritto	107 cm

POSIZIONE DEI RIVETTI SULLA PIASTRA

CONFIGURAZIONE	SOTTOSTRUTTURA N. RIVETTI	CONFIGURAZIONE	SOTTOSTRUTTURA N. RIVETTI
greca 250 mm parallela	ACCIAIO 4	greca 333 mm parallela	ACCIAIO/ ALLUMINIO 4
	ALLUMINIO 4 + 2		
greca 250 mm perpendicolare	ACCIAIO 4	greca 333 mm perpendicolare	ACCIAIO/ ALLUMINIO 4
	ALLUMINIO 4 + 2		

Area interna
Area esterna

TABELLA INTERASSI AMMISSIBILI [Tabella 1 - Interassi]

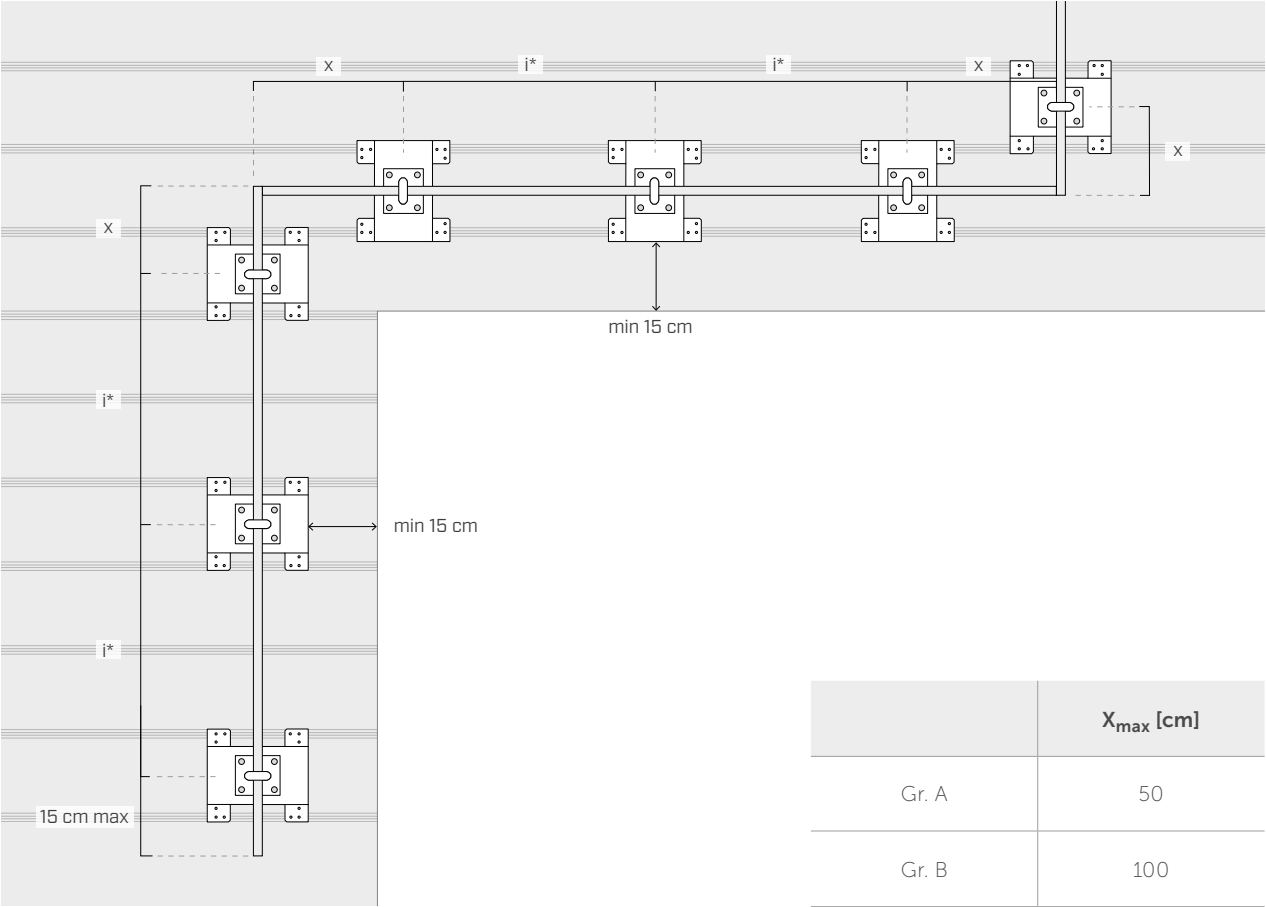
Di seguito sono riportati gli interassi massimi di installazione del parapetto **BORDER M**.
Per il fissaggio devono essere utilizzati esclusivamente i rivetti forniti nel KITRIV (Ø 6.3 mm).

			Gr. A	Gr. B
TIPOLOGIA			EN 14122-3: 2016 NF E 86-015: 2019 DGVV 201-056* OSHA 1810.29	EN 13374 cl. A DGVV 201-056*
BORDER M	greca 250 mm parallela		150	250
	greca 250 mm perpendicolare		150	250
	greca 333 mm parallela		150	250
	greca 333 mm perpendicolare		133	233

* DGVV 201-056: disponibile sia in configurazione di parapetto permanente (EN 14122) sia di parapetto temporaneo (EN 13374).

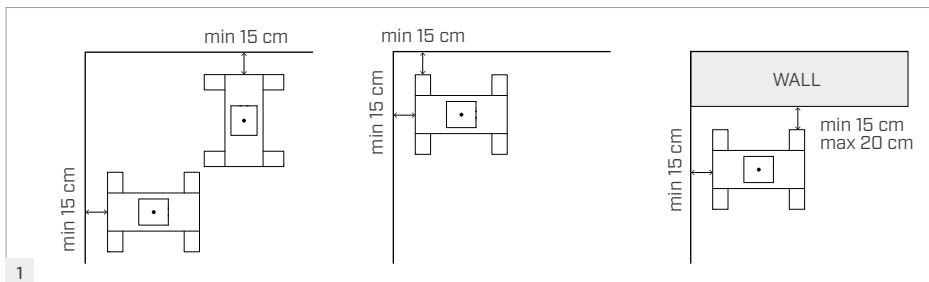
SCHEMA DI MONTAGGIO DEL PARAPETTO

Per tutte le configurazioni del parapetto **BORDER M** è necessario attenersi ai seguenti criteri di installazione:

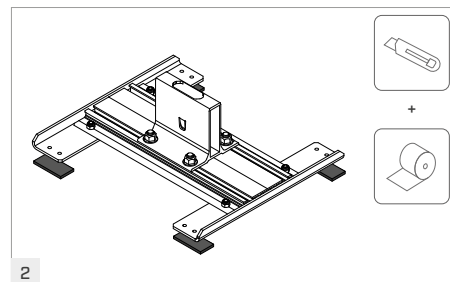


* i : interassi di riferimento secondo la Tabella 1 - Interassi (pag. 9)

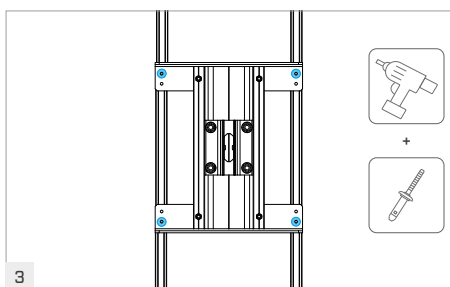
INSTALLAZIONE DEL PARAPETTO



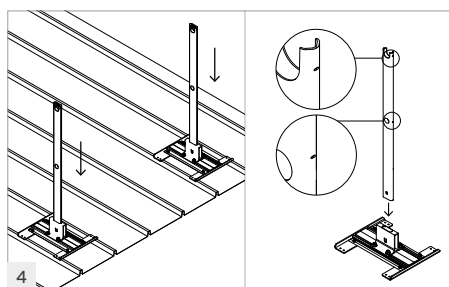
Per l'installazione del parapetto **BORDER M** è necessaria la presenza di almeno due operatori qualificati. Per garantire una migliore riuscita, è consigliabile partire da un angolo.



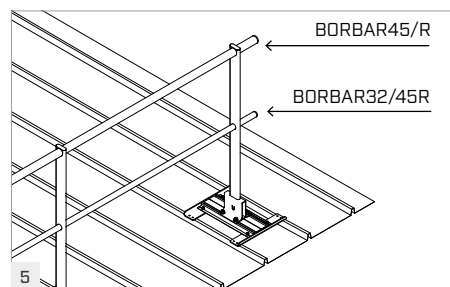
Utilizzare il nastro monoadesivo **EPDM253**, ritagliando la quantità necessaria per impermeabilizzare la superficie sottostante la piastra del **BORDER M**. Applicare il nastro facendo attenzione che il foro di collegamento della piastra sia completamente coperto dall'**EPDM**.



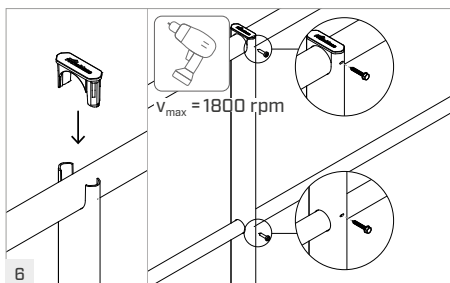
Predisporre le piastre **M** secondo la normativa applicabile, quindi procedere al fissaggio della piastra **BORBASEM** alla sottostruttura, utilizzando il numero di fissaggi indicato in tabella (tab.1, pag. 9).



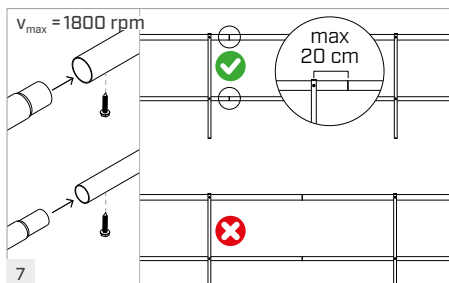
Inserire i montanti nelle piastre **BORBASEM** con i segni rivolti verso l'operatore. Verificare il corretto incastro tra alette e finestre. Non servono viti per il fissaggio. Per rimuovere il sistema base-montante, spingere la base verso l'alto. Se sono presenti viti, rimuoverle e forare Ø6 mm nel punto del foro a cono.



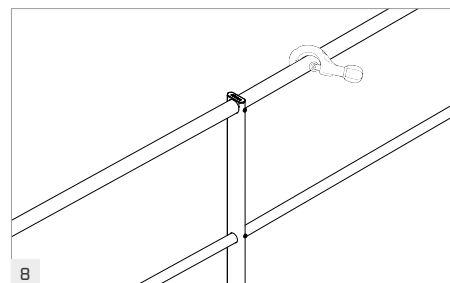
Inserire il corrente intermedio **BORBAR32** e successivamente il corrente superiore **BORBAR45**. In conformità alla norma **EN 13374**, è necessario installare i correnti rinforzati **BORBAR45R**.



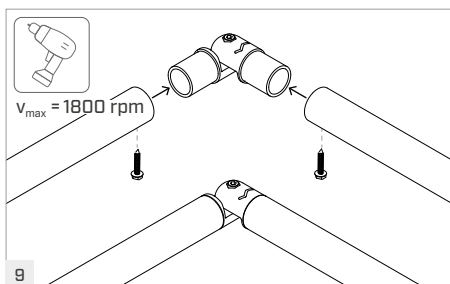
Inserire il tappo **BORCAP** sulla sommità del montante. Fissare i correnti ai montanti con la vite **MMS5525A2** in corrispondenza dei due segni laterali.



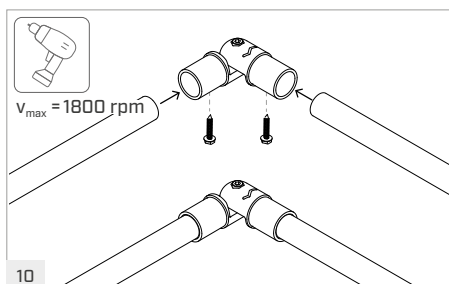
Collegare le estremità maschio/femmina di corrimano e correnti, fissandole con viti **MM-S5525A2**. Secondo **EN 14122**, il corrimano deve terminare a non più di 20 cm dal montante più vicino. Posizionare le viti sotto i correnti.



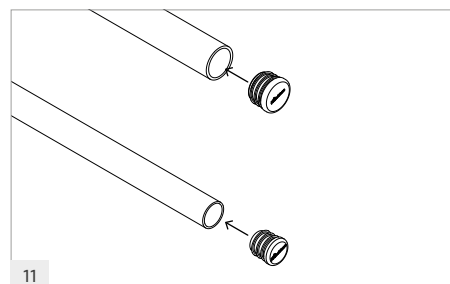
Adattare l'ultima sezione del parapetto tagliando la parte in eccesso dei correnti secondo le indicazioni dello schema a pag. 10



Inserire lo snodo angolare **BORCOR** nel corrimano e fissare con viti autofilettanti **MM-S5525A2**.

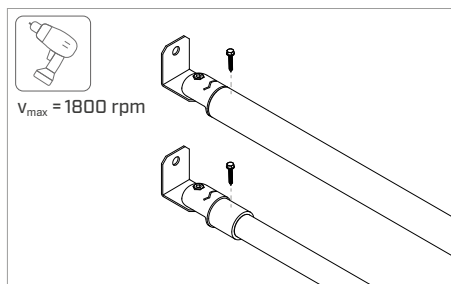


Inserire lo snodo angolare **BORCOR** esternamente al corrente intermedio e fissare con viti autofilettanti **MMS5525A2**.

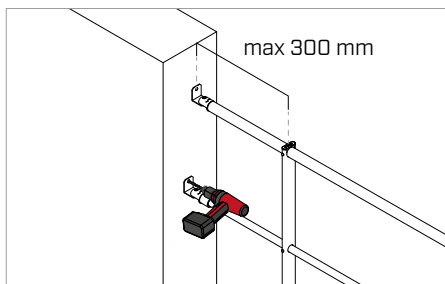


Inserire i tappi **BORCAP45** e **BORCAP32** rispettivamente nei corrimani e correnti intermedi.

IT INSTALLAZIONE BORWALL

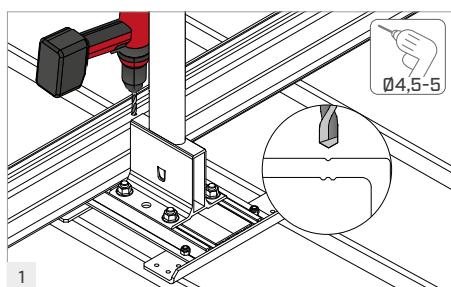


Inserire corrimano e corrente intermedio nell'elemento terminale a muro **BORWALL** e fissare con vite autofilettante **MMS5525A2**.

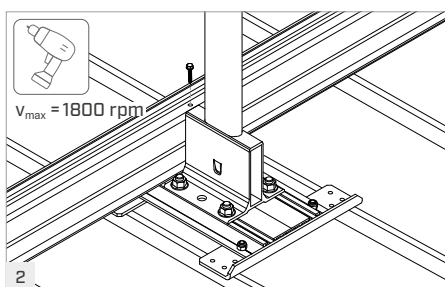


Rispettare la distanza massima di **300 mm** dal muro. Forare il muro con punta Ø10 mm e fissare l'elemento terminale con un tassello M10 (AB110115) o su legno con VGS Ø9 (VGS9100 + HUS8).

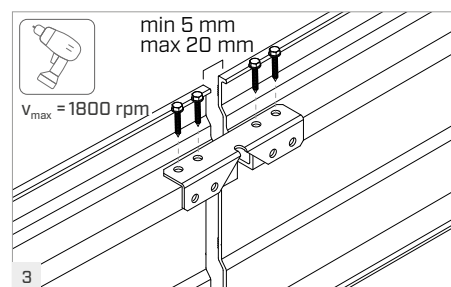
BORTB



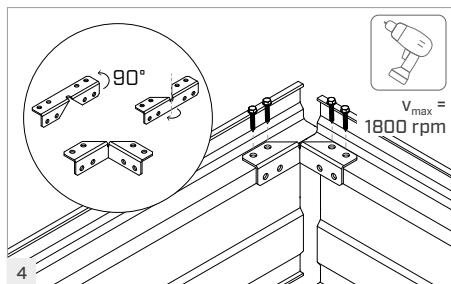
Posizionare **BORTB** con l'appoggio contro lo spallamento della base **BORBASEM**. Eseguire un preforo passante Ø 5 mm. Usare la scanalatura sull'appoggio come guida per la punta dell'avvitatore.



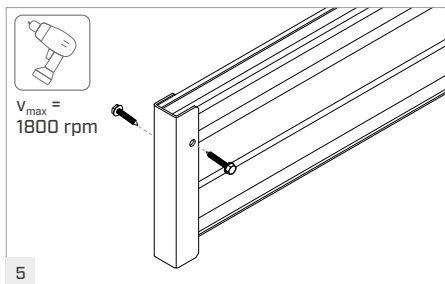
Una volta eseguito il preforo, è possibile fissare la tavola fermapiEDE alla base con una vite **MMS5525A2**.



Unire le estremità di **BORTB** con il connettore **BORTBJUN**. Fissare con 4 viti **MMS5525A2**, lasciando almeno 5 mm tra le tavole per evitare deformazioni termiche.



Negli angoli, ruotare e piegare a mano il connettore **BORTBJUN** fino a raggiungere l'angolo desiderato. Fissare con 4 viti autofilettanti **MMS5525A2**.



Fissare i tappi terminali della tavola fermapiEDE con 2 viti autofilettanti **MMS5525A2**.

INSTALLAZIONE DEL CANCELLETTO

BORGATE600

EN
13374: 2025
CIA

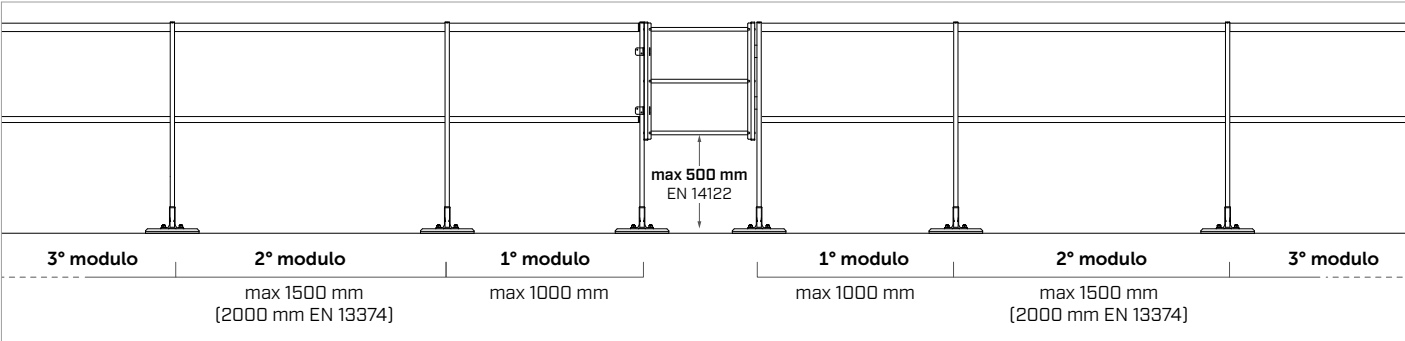
EN
13374: 2013
+AT: 2018
CIA

EN
13374:
2025 CIA

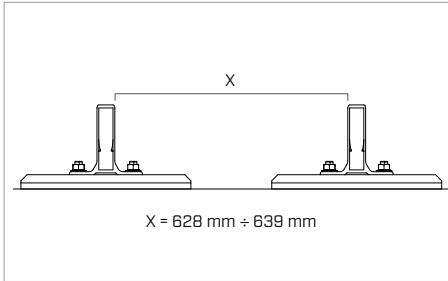
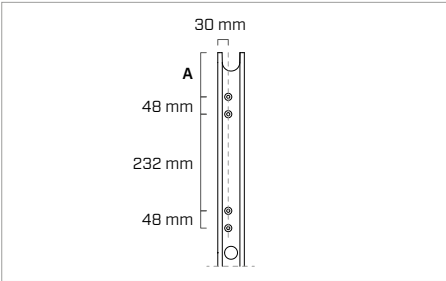
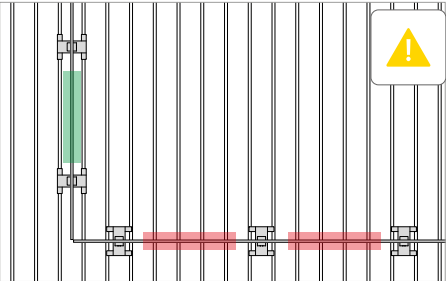
DBUV
201-056

L'installazione del cancelletto **BORGATE600** deve essere eseguita rispettando i requisiti minimi di stabilità del sistema. È quindi necessario installare almeno tre montanti per lato, seguendo questa distribuzione massima degli interassi:

- **1° modulo:** 1000 mm max
- **2° modulo:** 1500 mm max (per EN 14122 3) - 2000 mm max (per EN 13374)
- **3° modulo:** secondo quanto riportato in Tabella 1 – Interassi



⚠ Il bordo inferiore del cancelletto deve trovarsi a una distanza inferiore a **500 mm** dal piano di calpestio, come previsto dalla EN 14122-3. Verificare la distanza massima consentita dalla normativa applicabile (es. EN 13374: spazio massimo 470 mm).



L'installazione del cancelletto su parapetti fissati a lamiera grecata o pannello sandwich è consentita solo quando il sistema è posato parallelamente alla direzione delle greche. Quando il parapetto è installato perpendicolarmente alle greche, il montaggio del cancelletto non è possibile.

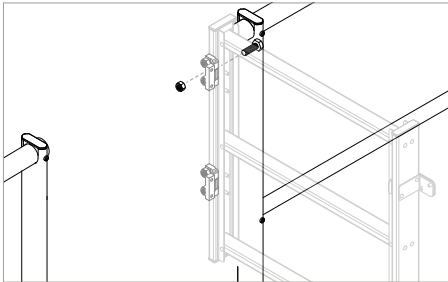
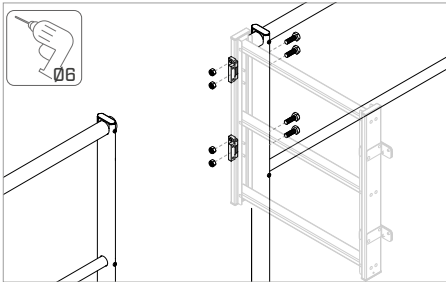
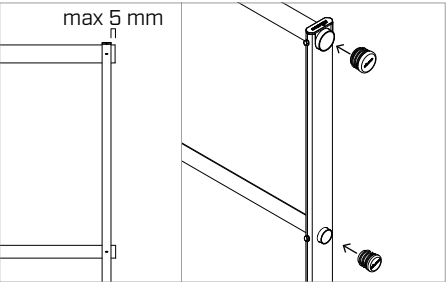
Riportare sul montante le misure indicate nel disegno⁽¹⁾ e realizzare:

- **n. 4 fori Ø 6,5 mm** lato cancelletto;
- **n. 4 fori Ø 18 mm (min.)** lato esterno.

⁽¹⁾ Il valore A è definito in funzione delle altezze di progetto richieste (vedi tabella sotto).

Fissare le piastre **BORBASEM** a terra assicurando un interasse x compreso tra 628 mm e 639 mm.

	H montante [cm]	EN 14122-3: 2016	DBUV 201-056	EN 13374: 2025 CIA	EN 13374: 2013 +AT: 2018 CIA	DBUV 201-056	NF E85-015: 2019	OSHA 1910.29
		Valore A [mm]		Valore A [mm]				
dritto/ribaltabile + greca 250 mm	110	130		160		N/A	N/A	N/A
	100	130		130		N/A	N/A	N/A
dritto/ribaltabile + greca 333 mm	110	130		160		N/A	N/A	N/A
	100	130		130		N/A	N/A	N/A



Posizionare i correnti in modo che non sporgano oltre **5 mm** rispetto al fianco del montante. Se necessario, tagliare la parte eccedente. Successivamente montare il tappo previsto per il tipo di **tubo** utilizzato.

Montare il cancelletto utilizzando le **viti M6** e i **dadi autobloccanti** forniti nel sacchetto in dotazione.

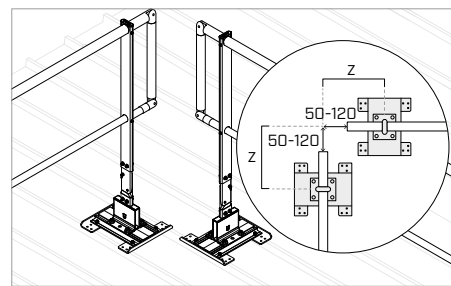
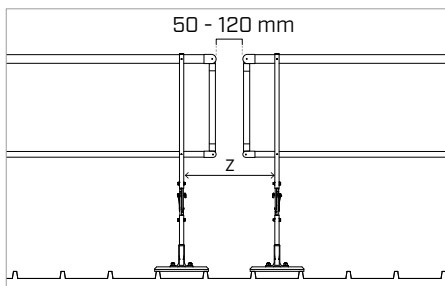
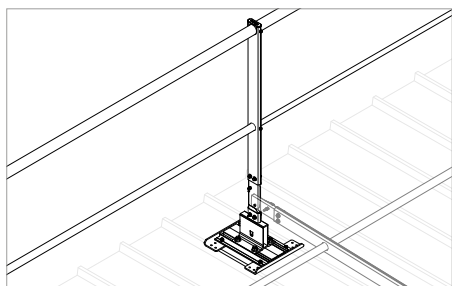
Per limitare l'**effetto vela** del cancelletto in presenza di vento o durante i periodi di non utilizzo, è possibile installare una **vite M10 aggiuntiva** (non inclusa in dotazione) per bloccare la chiusura in modo permanente.

INSTALLAZIONE DEL PARAPETTO RIBALTABILE

BORUP100F - BORUP110F

Per l'installazione dei parapetti ribaltabili, la procedura descritta in precedenza rimane valida. Tuttavia, è necessario prestare attenzione ad alcune istruzioni aggiuntive:

EN 13374: 2025 CIA	EN 13374: 2013 +A1: 2018 CIA	EN 14122-3: 2016	NF E85-015: 2019
--------------------------	---------------------------------------	------------------------	------------------------



I parapetti ribaltabili per **BORDER M** devono essere installati dal lato del giunto (non lato perno), in modo che il ribaltamento del montante avvenga verso il lato del tetto e mai verso l'esterno.

I parapetti ribaltabili per **BORDER M** sono installati in moduli di 9 m (7 montanti collegati) o 12 m (9 montanti collegati). Installare due montanti terminali con le seguenti distanze massime:

BORBASEM250: $z_{max} = 500$ mm

BORBASEM333PE/PA: $z_{max} = 666$ mm

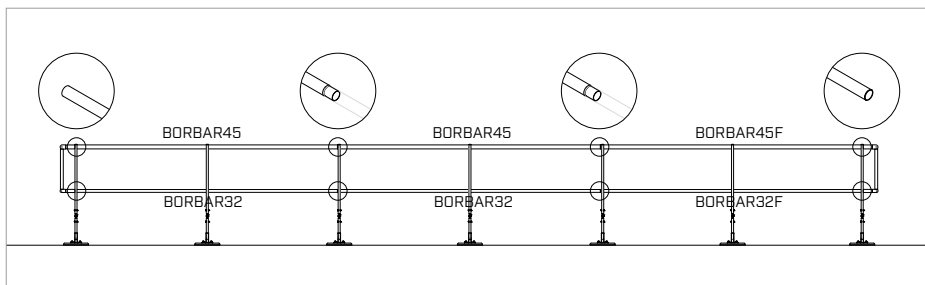
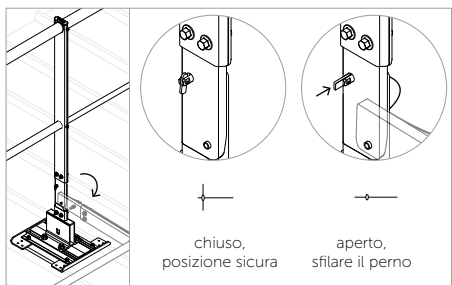
Mantenere inoltre una distanza compresa tra 50 e 120 mm tra i correnti terminali verticali **BORBARENDF**.

Installare due montanti terminali con le seguenti distanze massime:

BORBASEM250: $z_{max} = 250$ mm

BORBASEM333PE/PA: $z_{max} = 350$ mm

Mantenere inoltre una distanza compresa tra 50 e 120 mm tra i correnti terminali verticali **BORBARENDF**.



Per il ribaltamento dell'intero parapetto, sfilare i perni dalle rispettive sedi.

I correnti principali da utilizzare sono il **BORBAR45** e il **BORBAR32**, tuttavia ciascun modulo deve terminare con i correnti specifici senza riduzione **BORBAR45F** e **BORBAR32F**.

	EN 14122-3: 2016	DVGU 201-056	EN 13374: 2025 CIA	EN 13374: 2013 +A1: 2018 CIA	DVGU 201-056	NF E85-015: 2019	OSHA 1910.29
Montante H = 110 cm	BORUP110F		BORUP110FR			BORUP110F	N/A
Corrente superiore	BORBAR45/F		BORBAR45R*			BORBAR45/F	N/A
Corrente intermedio	BORBAR32/F		BORBAR45R*			BORBAR32/F	N/A
Montante H = 100 cm	N/A		N/A			BORUP100F	N/A
Corrente superiore	N/A		N/A			BORBAR45/F	N/A
Corrente intermedio	N/A		N/A			BORBAR32/F	N/A

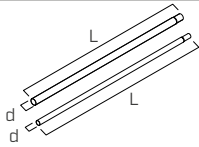
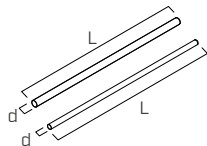
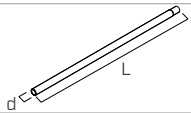
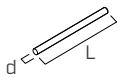
* Per correnti terminali in applicazione EN 13374 è necessario tagliare la parte con riduzione eccedente.

AVVERTENZE GENERALI PER L'USO

- Prima di procedere con il ribaltamento del parapetto, verificare che l'operatore sia in condizioni di sicurezza. L'utente deve essere ancorato a un dispositivo anticaduta, come una linea vita **PATROL** o un punto di ancoraggio **KITE**. Inoltre, è necessario verificare che tutti gli strumenti e le attrezzature siano in buone condizioni di funzionamento e che l'area di installazione sia libera da ostacoli.
- I moduli di 9 m possono essere maneggiati da un solo operatore. I moduli di 12 m richiedono un operatore aggiuntivo per il corretto ribaltamento.

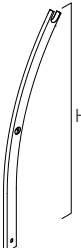
CODICI E DIMENSIONI

CORRENTI

CODICE	d [mm]	L [mm]	
BORBAR45	45	3000	
BORBAR32	32	3000	
BORBAR45F	45	3000	
BORBAR32F	32	3000	
BORBAR45R	45	3000	
BORBARENDF	45	417	

EN AW
6063-T6

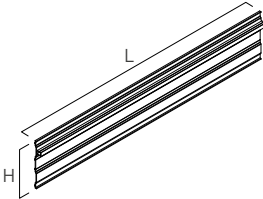
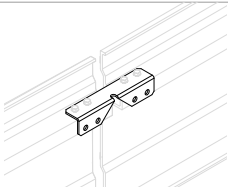
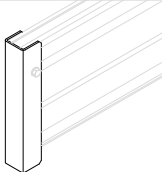
MONTANTI

CODICE	H [mm]	
BORUP530WH	535	
BORUP760WH	765	
BORUP100	1005	
BORUP110	1105	
BORUP118	1185	
BORUP130	1305	
BORUP100F	1005	
BORUP110F BORUP110FR	1105	
BORUP113C	1120	
BORUP100R	1005	
BORUP110R	1105	
BORUP107US	1075	

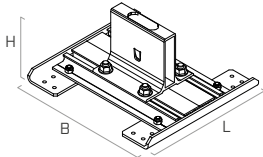
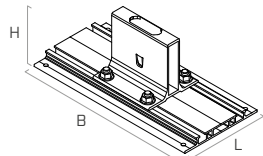
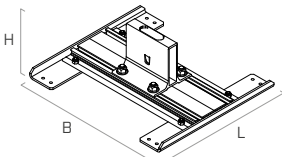
EN AW
6005A-T6

CODICI E DIMENSIONI

TAVOLA FERMAPIEDE

CODICE		H [mm]	L [mm]	
BORTB	EN AW 6063-T6	150	3000	
BORTBJUN	EN AW 6063 H111	-	-	
BORTBCAP	EN AW 6063 H111	-	-	

BASI

CODICE	B [mm]	H [mm]	L [mm]	
BORBASEM250	305	138,5	280	
BORBASEM333PA	365	133,5	175	
BORBASEM333PE	420	138,5	365	

FISSAGGIO

CODICE		d [mm]	H [mm]	
MMS5525A2	1.4301 AISI304 INOX	5,5	25	
RIV6320		6,3	20,2	

CODICI E DIMENSIONI

CANCELLETTO DI SICUREZZA

CODICE		L [mm]	H [mm]	
BORGATE600	EN AW 5083 H111	600	640	

ACCESSORI

CODICE			
BORCAP45			
BORCAP32	LOPE		
BORCAP			
BORCOR	PP RECYCLED		
BORWALL	PP RECYCLED 1.4301 AISI304 INOX		
EPDM253	EPDM		

SICHERHEITSHINWEISE, GEBRAUCHS- UND MONTAGEANLEITUNG

EINFÜHRUNG

DEFINITION

Das Geländer **BORDER M** ist ein kollektives Absturzsicherungssystem. Es eignet sich hervorragend für die Dachsicherheit, besteht aus einer Aluminiumlegierung (**EN AW 6005A-T6** und **EN AW 6063-T6**) und kann auf Dächern mit einer Neigung von bis zu 10° montiert werden.

NORMEN

Das Geländer mit horizontaler Befestigung **BORDER M** entspricht den folgenden Vorschriften:

- **EN 14122-3:2016**
- **EN 13374:2025 Kl. A (außer Punkt 9)**
- **EN 13374:2013+A1:2018 Kl. A (außer Punkt 9)**
- **NF E85-015:2019 (Frankreich)**
- **DGUV 201-056 (Deutschland)**
- **OSHA 1910.29 (USA)**

Die folgende Tabelle fasst die wichtigsten geometrischen Parameter zusammen, die in den einzelnen Vorschriften gefordert werden:

	EN 14122-3: 2016	EN 13374: 2025	EN 13374: 2013 + A1: 2018 Kl. A	NF E85-015: 2019	OSHA 1910.29
Min. Höhe der begehbaren Fläche	1,1 m	1 m		1 - 1,1 m	0,99 - 1,14 m (39 - 45 in)
Max. Achsabstand zwischen den Mittelläufen	500 mm	470 mm		500 mm	480 mm
Max. Achsabstand zwischen den Pfosten	1,5 m (empfohlen)	-		1,5 m (empfohlen)	-
Min. Höhe Fußleiste	10 cm	15 cm		10 cm	-

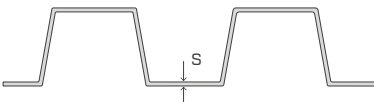
VERWENDUNG - WARTUNG

- Vor der Nutzung per Sichtprüfung sicherstellen, dass das Schutzgeländer **BORDER** keine Mängel, Schäden oder Verformungen aufweist (wie Stöße, Verbiegungen usw.).
- Für das Geländer **BORDER** ist keine spezielle Wartung erforderlich. Es muss jedoch einmal jährlich von einer sachkundigen Person visuell geprüft werden.
- Wenn das Geländer **BORDER** unsachgemäß montiert oder beschädigt ist oder bereits einen Absturz abgefangen hat, ist die Nutzung unverzüglich einzustellen. Es darf erst nach einer Inspektion und Überprüfung, aufgrund derer eine sachkundige Person die Genehmigung erteilt, wieder in Betrieb genommen werden.
- Wenn das Produkt außerhalb des Bestimmungslandes weiterverkauft wird, muss der Händler zwingend die Betriebsanleitung in der Sprache des Landes bereitstellen, in dem das Produkt verwendet wird. Diese Unterlagen können auf Anfrage vom Hersteller zur Verfügung gestellt werden.
- Das Geländer **BORDER** ist eine permanente kollektive Schutteinrichtung, die ausschließlich von Fachleuten auf Dächern verwendet wird, welche für die Öffentlichkeit nicht zugänglich sind.
- Bei der Montage in einer schadstoffbelasteten Industrie-, Petrochemie-, Schiffbau- oder Meeresumgebung muss die Oberfläche des Geländers **BORDER** entsprechend behandelt werden, z. B. durch Pulverlackierung, Eloxierung usw.
- Bei Bedarf sollte das Geländer gemäß den örtlichen Vorschriften an eine Blitzschutzanlage angeschlossen werden. Nicht als Erdungsleitung des Blitzableiters verwenden.
- Falls ein Grundriss bereitgestellt wurde, bei der Montage auf dieses Dokument Bezug nehmen.

LAGERUNG

Die unbehandelten Aluminiumteile sind in der Verpackung nicht voneinander getrennt. Regeneinwirkung auf die geschlossene Verpackung kann die Oxidation dieser Komponenten begünstigen. Infolge dessen können Flecken auf der Oberfläche entstehen. Sie beeinträchtigen zwar nicht die Qualität des Aluminiums, evtl. aber das Erscheinungsbild des Geländers. Es empfiehlt sich, die Verpackung zu öffnen und die Komponenten getrennt voneinander zu lagern (ohne gegenseitigen Kontakt) oder die noch verpackten Gebinde an einem trockenen Ort aufzubewahren.

UNTERKONSTRUKTIONEN UND BEFESTIGUNG

MINDESTANFORDERUNG	MATERIAL	S _{min}
	STAHL	0,4 mm
	ALUMINIUM	0,7 mm

WESENTLICHE KRÄFTE, DIE AUF DIE NIETEN EINWIRKEN

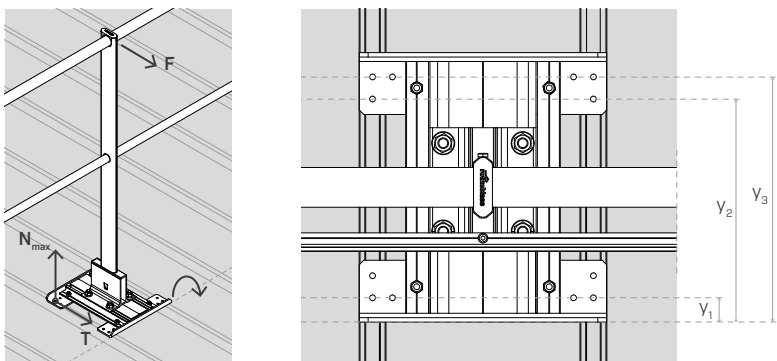
Die auf die Niete wirkenden Kräfte (Zug- und Scherkraft) werden unter den folgenden Annahmen ermittelt:

- Starrer Flansch und lineare Spannungsverteilung
- Hebelarm der Einwirkung entsprechend der Pfostenlänge (ungünstigster Fall H = 110 cm)
- Drehpunkt für die Momentenzerlegung auf der Flanschseite
- Maximaler Achsabstand und maximale punktuelle Last am Pfostenkopf gemäß der geltenden Norm.

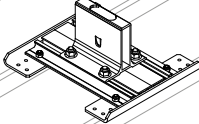
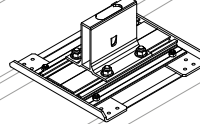
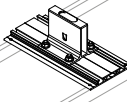
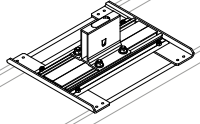
Die folgenden Werte beziehen sich auf die Beanspruchung der j-ten Niete in der im Verhältnis zur Drehachse am stärksten beanspruchten Nietreihe.

$$T = \frac{F}{N_{riv}}$$

$$N = \frac{M_f}{\sum_{j=1}^m n_j \cdot y_j^2} \cdot y_j$$



Die am stärksten beanspruchte Reihe entspricht der Achse y₃.

		BORBASEM250	BORBASEM250	BORBASEM333PA	BORBASEM333PE
					
T [N]	EN 14122-3: 2016 DGV 201-056*	131,3	131,3	131,3	116,4
N _{max} [N]		515,2	515,2	398,2	371,4
T [N]	EN 13374: 2025 DGV 201-056*	91,7	91,7	91,7	91,7
N _{max} [N]		359,8	359,8	278,1	292,5
T [N]	NF E85-015: 2019	154,7	154,7	154,7	137,2
N _{max} [N]		607,2	607,2	469,3	437,7
T [N]	OSHA 1910,29	148,3	148,3	148,3	148,3
N _{max} [N]		582,3	582,3	450,0	473,3

* DGV 201-056: sowohl als permanentes Geländer (EN 14122) als auch als temporäres Geländer (EN 13374) erhältlich.

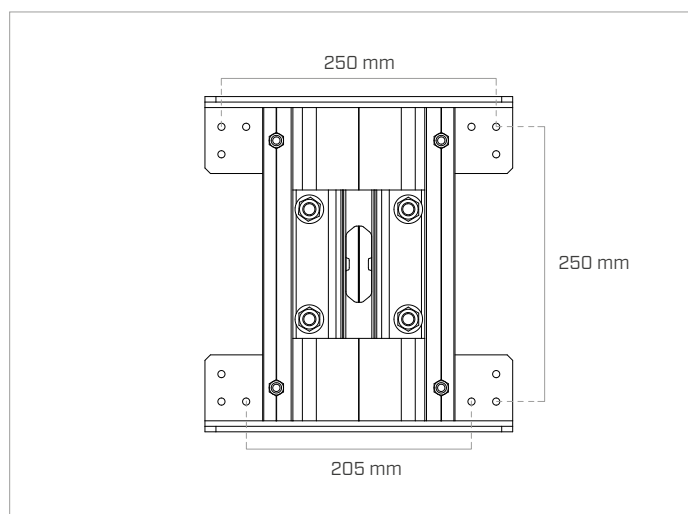
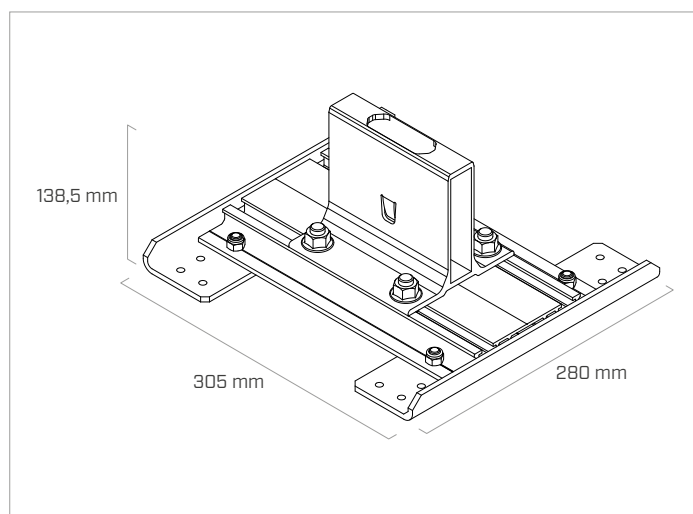
WERKZEUGE



GRUNDPLATTENTYPEN

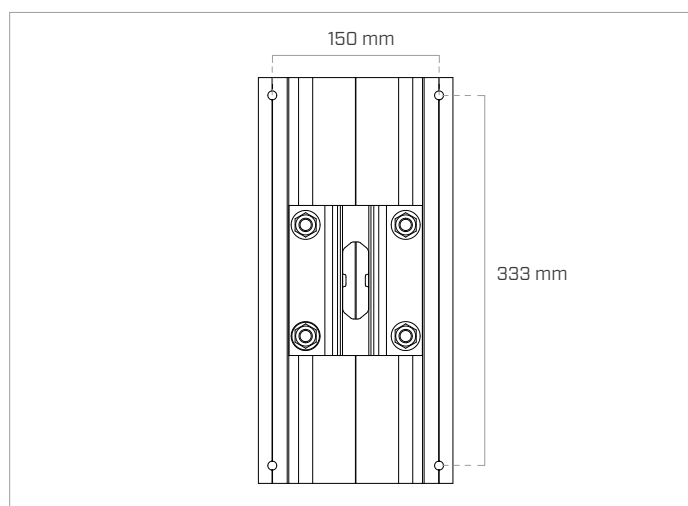
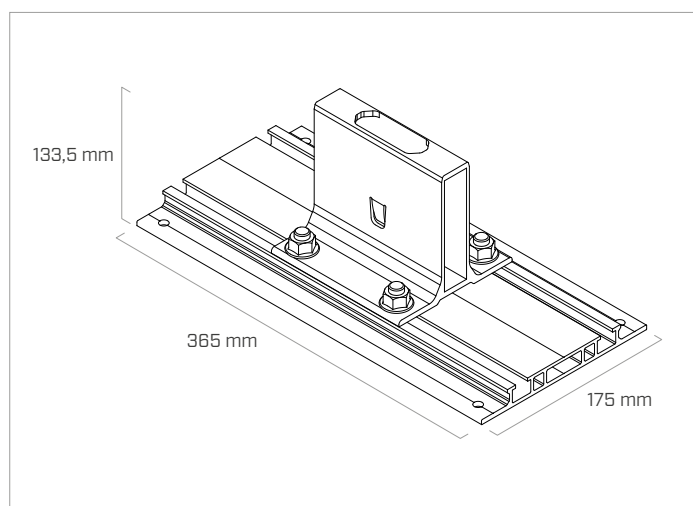
BORBASEM250

Universal-Grundplatte auf Trapezblech parallel und quer zu den Sicken. Passend für Sickenabstand 250 mm.



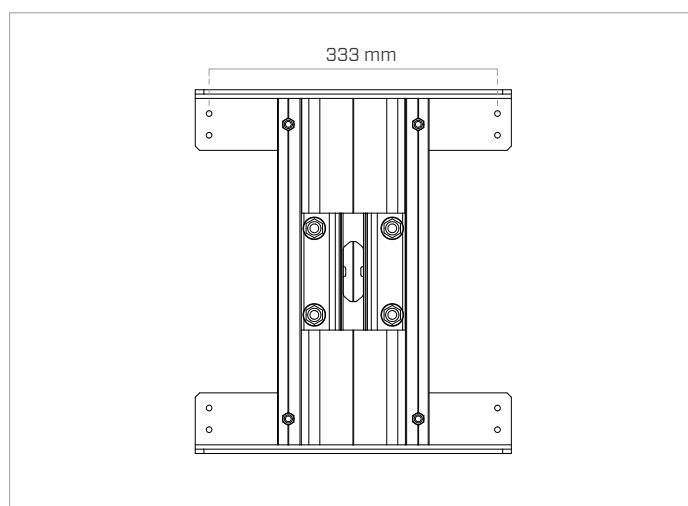
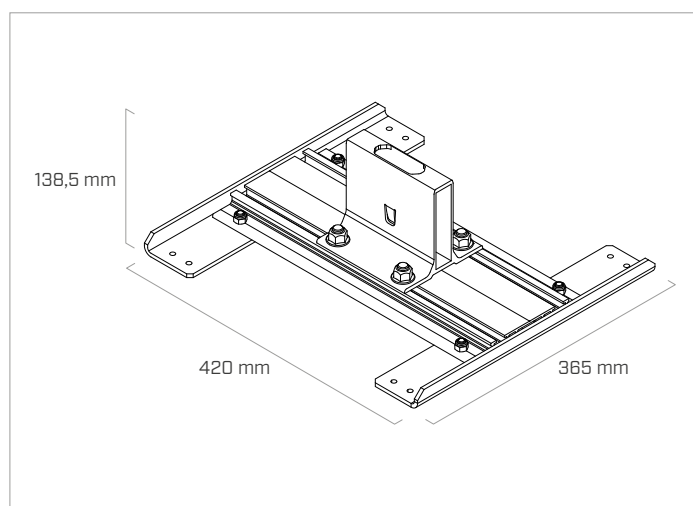
BORBASEM333PA

Grundplatte auf Trapezblech, parallel zu den Sicken. Passend für Sickenabstand 333 mm.



BORBASEM333PE

Grundplatte auf Trapezblech, quer zu den Sicken. Passend für Sickenabstand 333 mm.



IT
DE
EN
ES
FR
PT

BEFESTIGUNG UND MONTAGE DER GRUNDPLATTEN

Das Geländer auf Trapezblechen wird mit Nieten RIV6320 (Ø 6,3 x 20 mm – ETA-25/1169) mit integrierten Dichtscheiben sowie mit dem einseitigen Klebeband EPDM253 (25 x 3 mm, 20-m-Rolle) befestigt, um die Abdichtung der Befestigungseinheit an der Metallunterkonstruktion sicherzustellen.



WERKZEUG FÜR DIE BEFESTIGUNG:
Akku-Nietmaschine

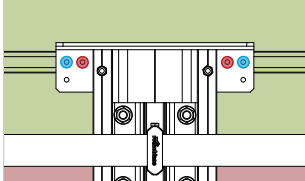
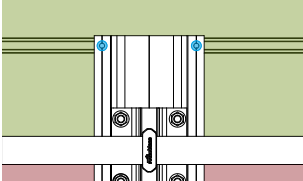
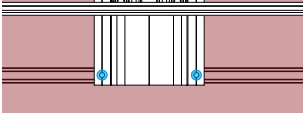
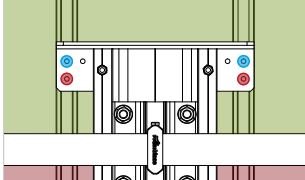
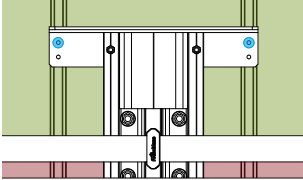
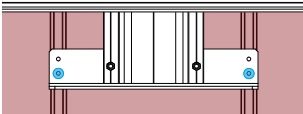
VOR DER BEFESTIGUNG	NACH DER BEFESTIGUNG
Niete RIV6320	
Grundplatte M	
Einseitiges Klebeband EPDM253	
Trapezblech	

MONTAGEANWEISUNGEN

Tabelle 1

Pfosten	Pfostentyp	H _{Pfosten}
BORUP100/R	gerade und gebogen	100 cm
BORUP110/R		110 cm
BORUP113C		110 cm
BORUP100F	klappbar	100 cm
BORUP110F/R		110 cm
BORUP107US	gerade	107 cm

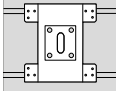
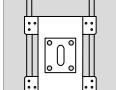
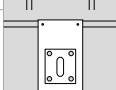
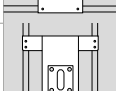
NIETENPOSITION AUF DER PLATTE

KONFIGURATION		UNTERKONSTRUKTION ANZ. NIETEN	KONFIGURATION		UNTERKONSTRUKTION ANZ. NIETEN
Sicke 250 mm parallel		STAHL 4 ●	Sicke 333 mm parallel		STAHL/ ALUMINIUM 4 ●
		ALUMINIUM 4 ● + 2 ●			
Sicke 250 mm quer		STAHL 4 ●	Sicke 333 mm quer		STAHL/ ALUMINIUM 4 ●
		ALUMINIUM 4 ● + 2 ●			

Innenbereich
 Außenbereich

TABELLE ZULÄSSIGE ACHSABSTÄNDE [Tabelle 1 - Achsabstände]

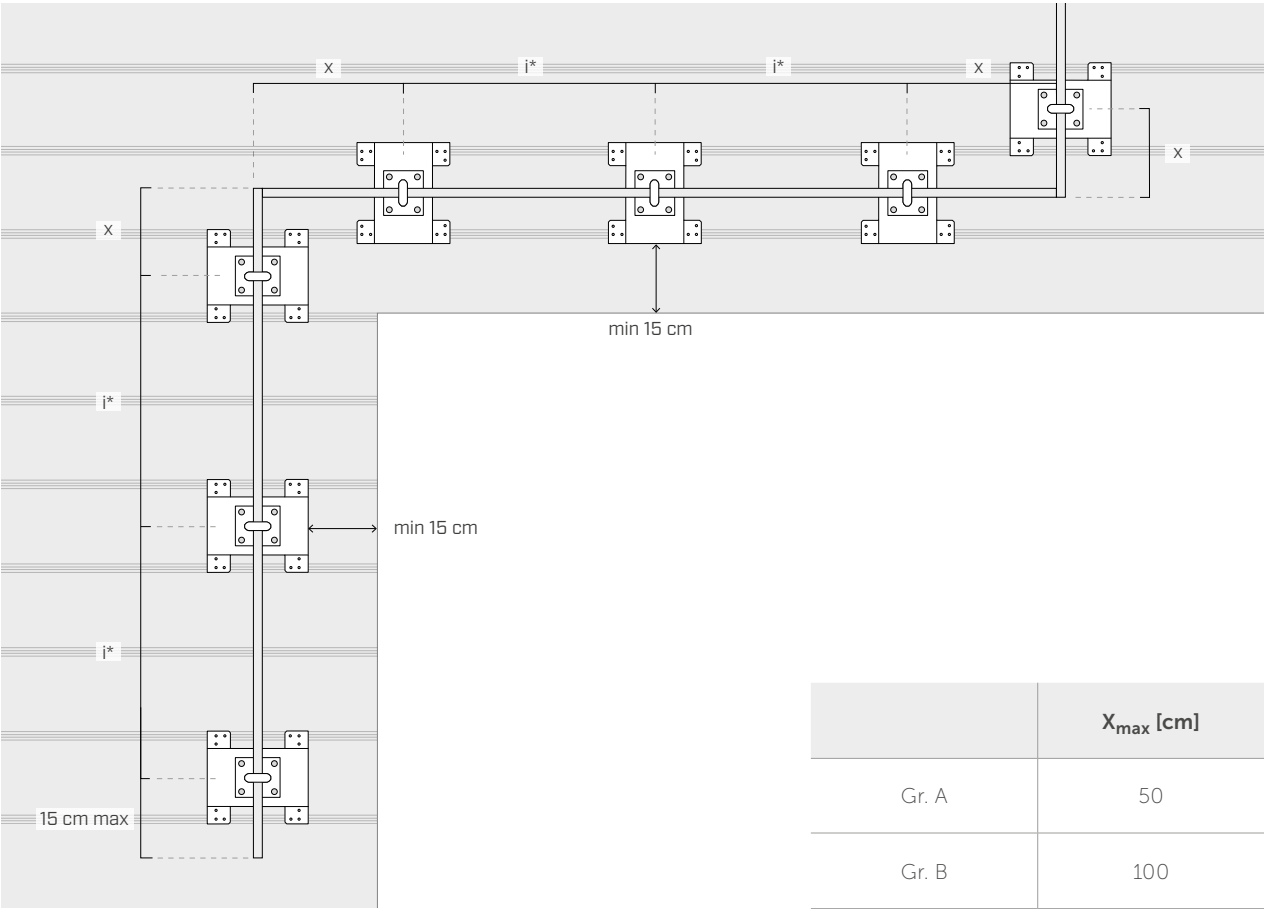
Nachfolgend sind die maximalen Montageabstände des Geländers **BORDER M** aufgeführt.
Für die Befestigung dürfen ausschließlich die im KITRIV (Ø 6,3 mm) enthaltenen Niete verwendet werden.

			Gr. A	Gr. B
TYP			EN 14122-3: 2016 NF E 85-015: 2019 DGUV 201-056* OSHA 1810,29	EN 13374 Kl. A DGUV 201-056*
BORDER M	Sicke 250 mm parallel		150	250
	Sicke 250 mm quer		150	250
	Sicke 333 mm parallel		150	250
	Sicke 333 mm quer		133	233

* DGUV 201-056: sowohl als permanentes Geländer (EN 14122) als auch als temporäres Geländer (EN 13374) erhältlich.

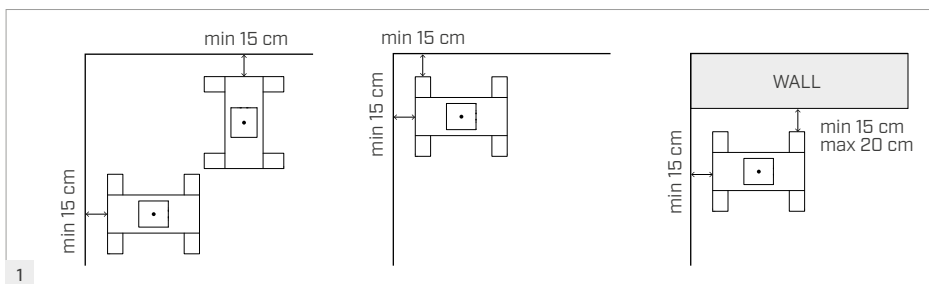
MONTAGEPLAN DES GELÄNDERS

Bei allen Konfigurationen des Geländers **BORDER M** sind die folgenden Montagekriterien zu beachten:

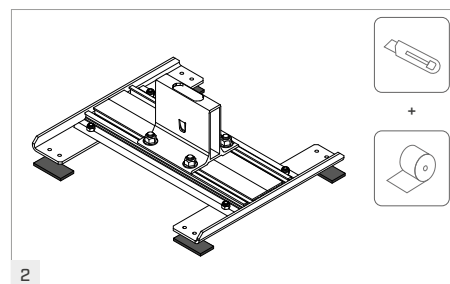


* i: Referenzabstände entsprechend Tabelle 1 - Achsabstände (S. 9)

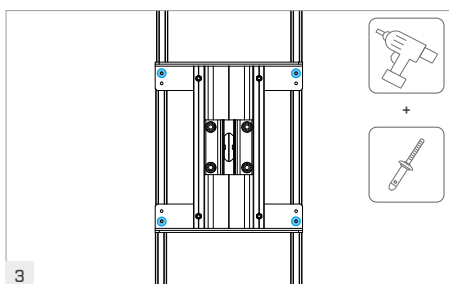
MONTAGE DES GELÄNDERS



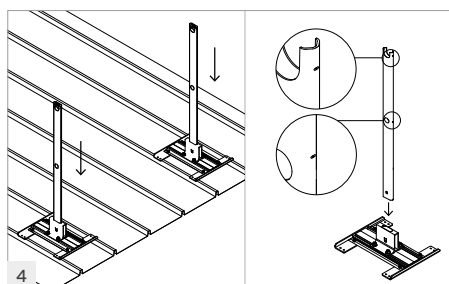
Für die Montage des Geländers **BORDER M** müssen mindestens zwei qualifizierte Monteure anwesend sein. Für ein besseres Ergebnis sollte die Montage in einer Ecke beginnen.



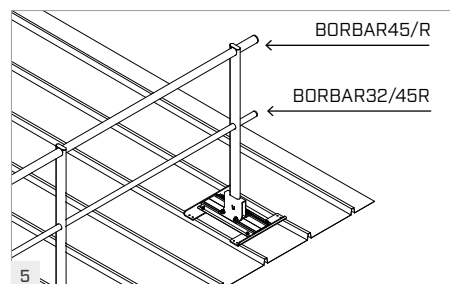
Vom einseitigen Klebeband **EPDM253** die erforderliche Länge zuschneiden, um die Oberfläche unterhalb der Grundplatte des **BORDER M** abzudichten. Das Band so aufbringen, dass die Verbindungsbohrung der Platte vollständig von der **EPDM**-Dichtung abgedeckt wird.



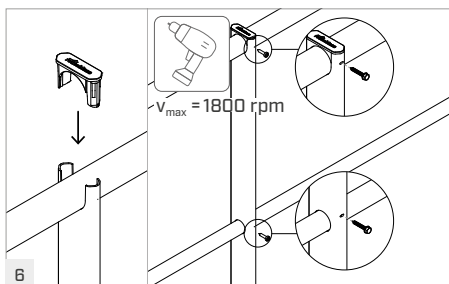
Die Platten **M** entsprechend den geltenden Normen ausrichten und anschließend die Platte **BORBASEM** an der Unterkonstruktion befestigen. Dazu die in der Tabelle (Tab. 1, S. 9) angegebene Anzahl Befestigungen verwenden.



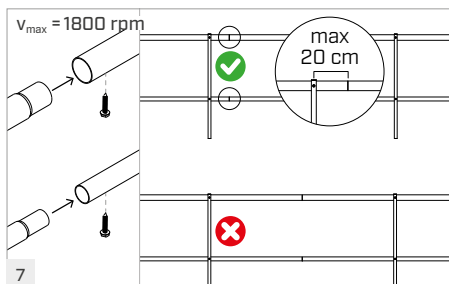
Die Pfosten so in die Platten **BORBASEM** einsetzen, dass die Markierungen zum Monteur zeigen. Die korrekt eingespannte Verbindung zwischen Laschen und Fenstern überprüfen. Zur Befestigung werden keine Schrauben benötigt. Zum Entfernen des Grundplatte-Pfosten-Systems wird die Grundplatte nach oben gedrückt. Falls Schrauben vorhanden sind, diese entfernen und an der Stelle der Konusbohrung ein Loch mit $\varnothing$ 6 mm bohren.



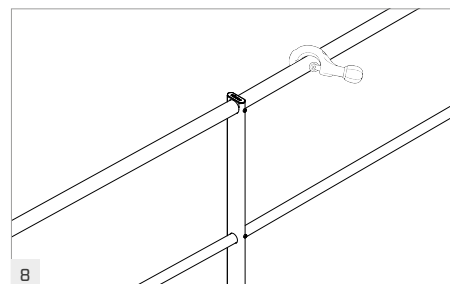
Den Mittellauf **BORBAR32** und daraufhin den oberen Handlauf **BORBAR45** einsetzen. Gemäß der Norm **EN 13374** müssen die verstärkten Handläufe **BORBAR45R** montiert werden.



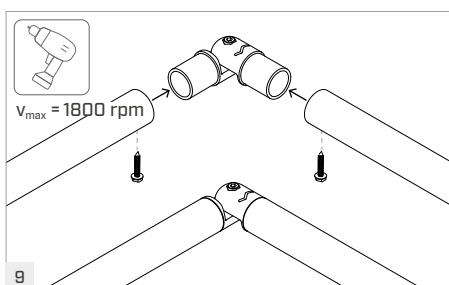
Die Kappe **BORCAP** am Pfostenkopf einsetzen. Die Handläufe mit den Schrauben **MMS5525A2** auf der Höhe der beiden seitlichen Markierungen befestigen.



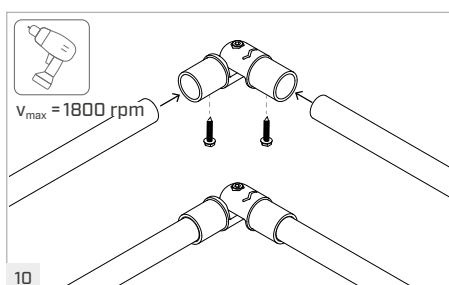
Die Steckenden des Handlaufs und der Mittelläufe ineinanderschieben und mit Schrauben **MMS5525A2** befestigen. Gemäß **EN 14122** darf der Handlauf nicht weiter als 20 cm vom nächsten Pfosten entfernt enden. Die Schrauben unter den Mittelläufen positionieren.



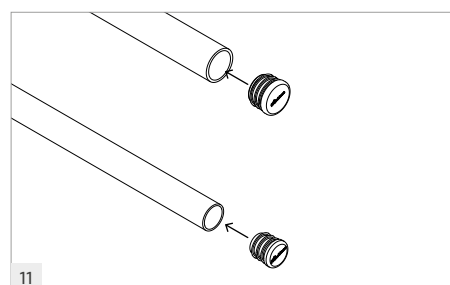
Den letzten Geländerabschnitt anpassen, indem der überstehende Teil der Läufe entsprechend den Angaben im Plan auf S. 10 abgetrennt wird.



Das Winkelgelenk **BORCOR** in den Handlauf einsetzen und mit gewindeschneidenden Schrauben **MMS5525A2** befestigen.



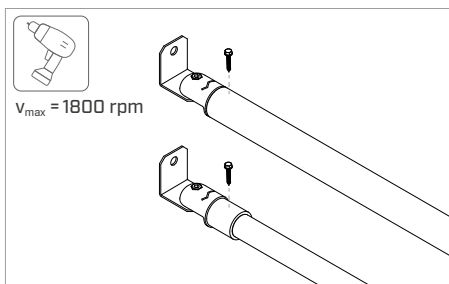
Das Winkelgelenk **BORCOR** außen in den Mittellauf einsetzen und mit gewindeschneidenden Schrauben **MMS5525A2** befestigen.



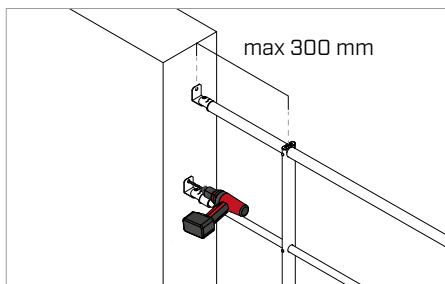
Die Kappen **BORCAP45** und **BORCAP32** jeweils in die Handläufe und Mittelläufe einsetzen.

MONTAGE

BORWALL

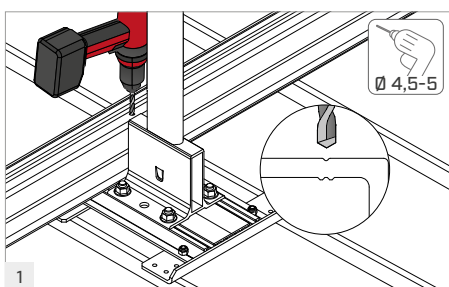


Handlauf und Mittellauf in das Wandabschluss-
element **BORWALL** einsetzen und mit der ge-
windeschneidenden Schraube **MMS5525A2**
befestigen.

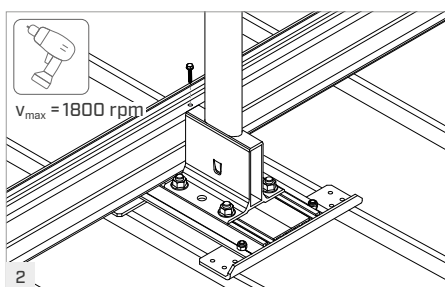


Den maximalen Abstand von **300 mm** zur
Wand einhalten. Mit einer Spitze Ø10 mm ein
Loch in die Wand bohren und das Abschluss-
element mit einem Dübel M10 (AB110115) oder
auf Holz mit VGS Ø9 (VGS9100 + HUS8) be-
festigen.

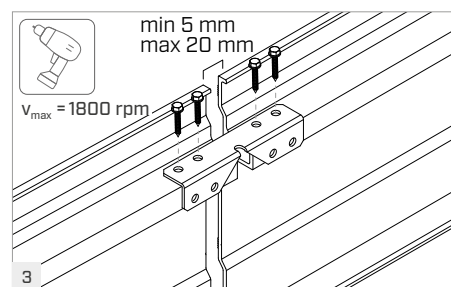
BORTB



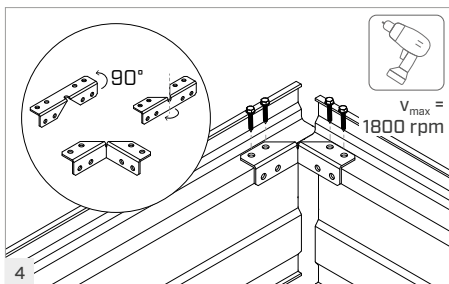
BORTB so positionieren, dass es an der Schul-
ter der Grundplatte **BORBASM** anliegt. Eine
durchgehende Vorbohrung mit Ø 5 mm vor-
nehmen. Die Nut auf der Auflage als Führung
für die Spitze des Schraubers verwenden.



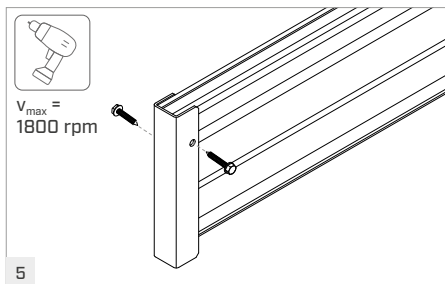
Nach dem Vorbohren kann die Fußleiste mit
einer Schraube **MMS5525A2** an der Grundplat-
te befestigt werden.



Die Enden von **BORTB** mit dem Verbinder
BORTBJUN verbinden. Mit 4 Schrauben
MMS5525A2 befestigen, wobei mindestens 5
mm zwischen den Platten liegen müssen, um
eine thermische Verformung zu vermeiden.



Den Verbinder **BORTBJUN** in den Ecken bis
zum gewünschten Winkel von Hand drehen
und biegen. Mit 4 gewindeschneidenden
Schrauben **MMS5525A2** befestigen.



Die Endkappen der Fußleiste mit 2 gewindeschnei-
denden Schrauben **MMS5525A2** befestigen.

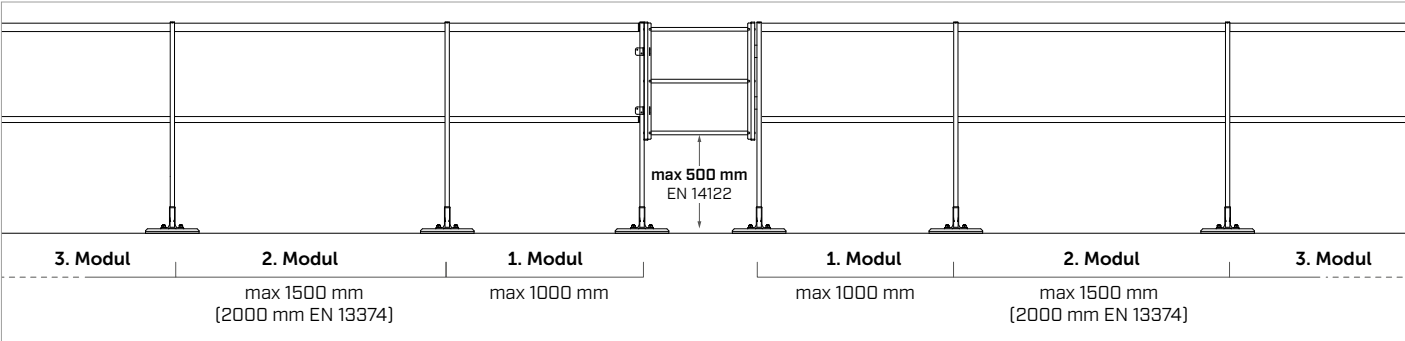
MONTAGE DES TORS

BORGATE600

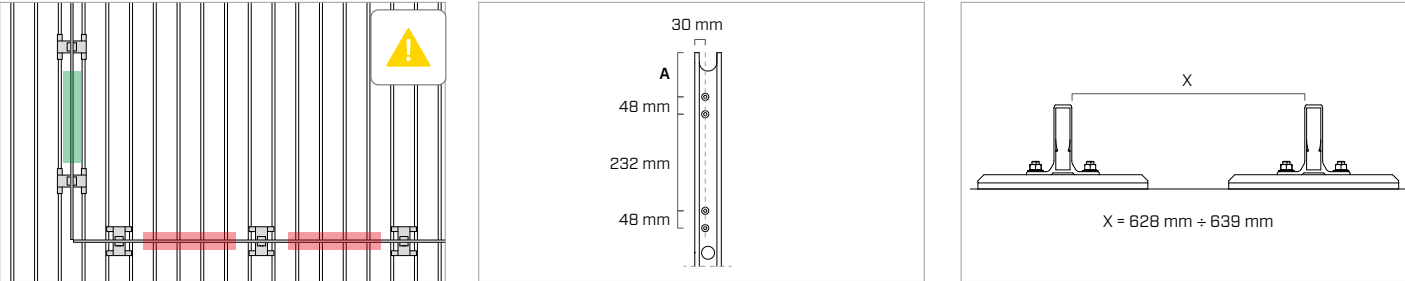
EN 13374: 2025 Kl. A	EN 13374: 2013 +A1: 2018 Kl. A	EN 13374: 2025 Kl. A	DEUV 201-056
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Für die Montage des Tors **BORGATE600** müssen die Mindestanforderungen an die Systemstabilität eingehalten werden. Dazu müssen pro Seite mindestens drei Pfosten montiert werden, wobei folgende maximale Pfostenabstände einzuhalten sind:

- **1. Modul:** 1000 mm max.
- **2. Modul:** 1500 mm max. (nach EN 14122 3) - 2000 mm max. (nach EN 13374)
- **3. Modul:** gemäß den Angaben in Tabelle 1 – Achsabstände



⚠ Die Unterkante des Tors muss einen Abstand von weniger als **500 mm** zur Begehungsfläche aufweisen, wie es die Norm EN 14122-3 vorschreibt. Den maximal zulässigen Abstand entsprechend den geltenden Vorschriften prüfen (z. B. EN 13374: lichter Abstand max. 470 mm).



Die Montage des Tors an Geländern, die auf Trapezblechen oder Sandwichpaneelen befestigt sind, ist nur zulässig, wenn das System parallel zum Sickenverlauf ausgerichtet ist. Sollte das Geländer quer zu den Sicken montiert sein, kann das Tor nicht eingebaut werden.

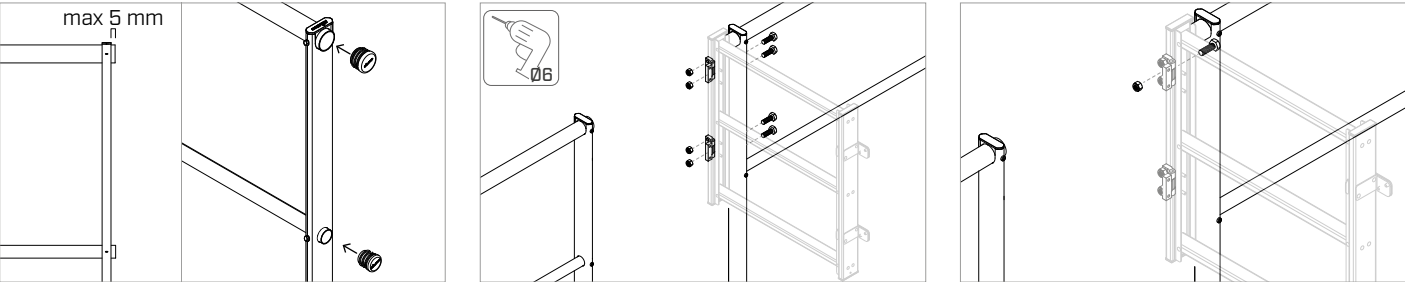
Die in der Zeichnung ⁽¹⁾ angegebenen Maße auf den Pfosten übertragen und folgende Bohrungen ausführen:

- **4 Löcher Ø 6,5 mm** torseitig;
- **4 Löcher Ø 18 mm** (min.) außenseitig;

⁽¹⁾ Der Wert A wird abhängig von den geforderten Planungshöhen bestimmt (siehe nachstehende Tabelle).

Die Platten **BORBASEM** mit einem Achsabstand X zwischen 628 mm und 639 mm am Untergrund befestigen.

	H Pfosten [cm]	EN 14122-3: 2016 DEUV 201-056 A-Wert [mm]	EN 13374: 2025 Kl. A EN 13374: 2013 +A1: 2018 Kl. A DEUV 201-056 A-Wert [mm]	NF E85-015: 2019	OSHA 1910.29
gerade/klappbar + Sicke 250 mm	110	130	160	N/A	N/A
	100	130	130	N/A	N/A
gerade/klappbar + Sicke 333 mm	110	130	160	N/A	N/A
	100	130	130	N/A	N/A



Die Läufe so positionieren, dass sie maximal **5 mm** über die Pfostenflanke hinausragen. Ggf. den überschüssigen Teil abschneiden. Anschließend die für den jeweiligen **Rohrtyp** vorgesehene Abdeckkappe montieren.

Das Tor mit den **M6-Schrauben** und den **selbstsichernden Muttern** montieren, die im mitgelieferten Beutel enthalten sind.

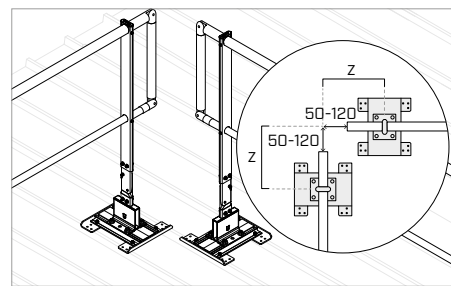
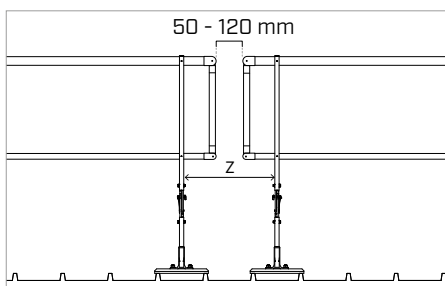
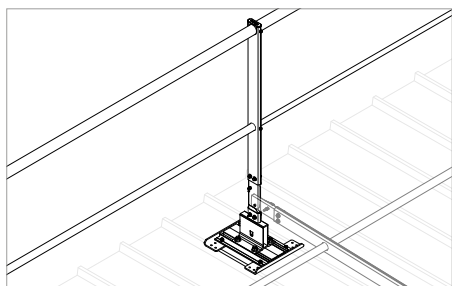
Um bei Windlast oder Nichtbenutzung **den Segeleffekt** des Tors zu verringern, kann eine **zusätzliche M10-Schraube** (nicht im Lieferumfang enthalten) eingesetzt werden, um das Tor dauerhaft geschlossen zu verriegeln.

MONTAGE DES KLAPPGELÄNDERS

BORUP100F - BORUP110F

Für die Montage der Klappgeländer gilt die zuvor beschriebene Vorgehensweise. Dabei sind jedoch einige zusätzliche Hinweise zu beachten:

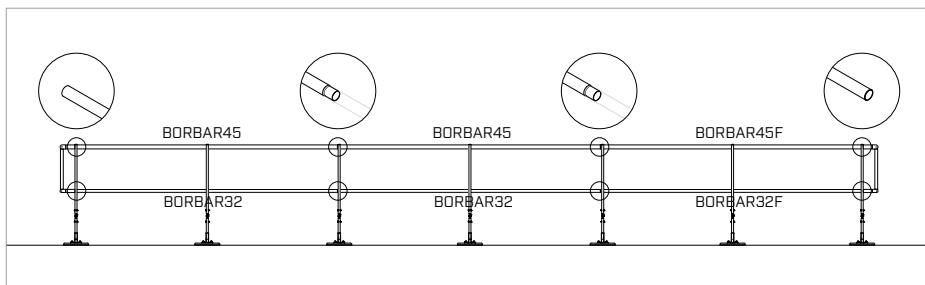
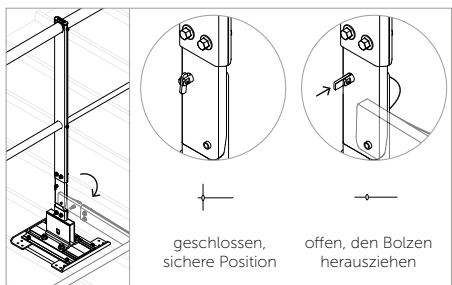
EN 13374:2025 KLA	EN 13374:2013 +A1:2018 KLA	EN 14122-3: 2016	NF E85-015: 2019
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Die klappbaren Geländer für **BORDER M** müssen auf der Stoßseite (nicht auf der Bolzen-seite) montiert werden, sodass das Abklappen des Postens zur Dachseite und niemals nach außen erfolgt.

Die Klappgeländer **BORDER M** werden in Modulen zu 9 m (7 miteinander verbundene Pfosten) oder 12 m (9 miteinander verbundene Pfosten) montiert. Zwei Endpfosten werden mit folgenden maximalen Abständen montiert:
BORBASEM250: $z_{\max} = 500 \text{ mm}$
BORBASEM333PE/PA: $z_{\max} = 666 \text{ mm}$
 Außerdem einen Abstand zwischen 50 und 120 mm zwischen den vertikalen Endholmen **BORBARENDF** einhalten.

Zwei Endpfosten werden mit folgenden maximalen Abständen montiert:
BORBASEM250: $z_{\max} = 250 \text{ mm}$
BORBASEM333PE/PA: $z_{\max} = 350 \text{ mm}$
 Außerdem einen Abstand zwischen 50 und 120 mm zwischen den vertikalen Endholmen **BORBARENDF** einhalten.



Zum Abklappen des gesamten Geländers die Bolzen aus den jeweiligen Aufnahmen herausziehen.

Hauptsächlich werden die Handläufe **BORBAR45** und **BORBAR32** verwendet, dennoch muss jedes Modul mit den spezifischen, nicht verjüngten Mittelläufen **BORBAR45F** und **BORBAR32F** abschließen.

	EN 14122-3: 2016	DVGU 201-056	EN 13374:2025 KLA	EN 13374:2013 +A1:2018 KLA	DVGU 201-056	NF E85-015: 2019	OSHA 1910.29
Pfosten H = 110 cm			BORUP110F	BORUP110FR		BORUP110F	N/A
Handlauf			BORBAR45/F	BORBAR45R*		BORBAR45/F	N/A
Mittellauf			BORBAR32/F	BORBAR45R*		BORBAR32/F	N/A
Pfosten H = 100 cm			N/A	N/A		BORUP100F	N/A
Handlauf			N/A	N/A		BORBAR45/F	N/A
Mittellauf			N/A	N/A		BORBAR32/F	N/A

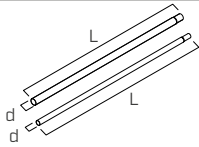
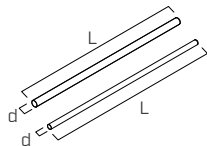
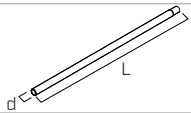
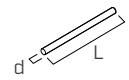
* Bei Endholmen für Anwendungen nach EN 13374 muss der überstehende Teil mit der Verjüngung abgeschnitten werden.

ALLGEMEINE VERWENDUNGSHINWEISE

- Vor dem Abklappen des Geländers sicherstellen, dass der Arbeiter gesichert ist. Der Anwender muss an einem Höhensicherungsgerät wie dem Seilsystem **PATROL** oder an einem Anschlagpunkt **KITE** verankert sein. Außerdem ist zu prüfen, ob alle Werkzeuge und Ausrüstungen in einwandfreiem Betriebszustand sind und der Montagebereich frei von Hindernissen ist.
- Die 9 m langen Module können von nur einem Anwender gehandhabt werden. Für die 12 m langen Module ist zum fachgerechten Abklappen eine weitere Person erforderlich.

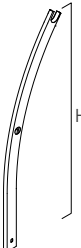
ARTIKELNUMMERN UND ABMESSUNGEN

HAND- UND MITTELLÄUFE

ART.-NR.	d [mm]	L [mm]	
BORBAR45	45	3000	
BORBAR32	32	3000	
BORBAR45F	45	3000	
BORBAR32F	32	3000	
BORBAR45R	45	3000	
BORBARENDF	45	417	

EN AW
6063-T6

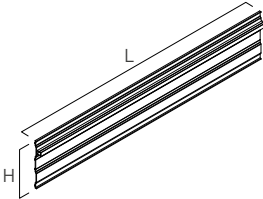
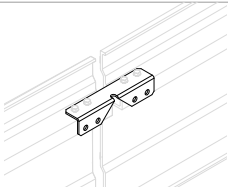
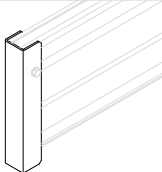
PFOSTEN

ART.-NR.	H [mm]	
BORUP530WH	535	
BORUP760WH	765	
BORUP100	1005	
BORUP110	1105	
BORUP118	1185	
BORUP130	1305	
BORUP100F	1005	
BORUP110F BORUP110FR	1105	
BORUP113C	1120	
BORUP100R	1005	
BORUP110R	1105	
BORUP107US	1075	

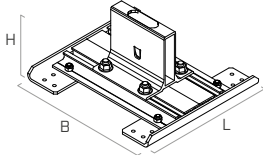
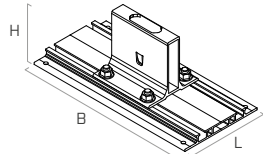
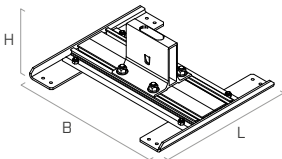
EN AW
6005A-T6

ARTIKELNUMMERN UND ABMESSUNGEN

FUSSLEISTE

ART.-NR.		H [mm]	L [mm]	
BORTB	EN AW 6063-T6	150	3000	
BORTBJUN	EN AW 6063 H111	-	-	
BORTBCAP	EN AW 6063 H111	-	-	

BASIS

ART.-NR.	B [mm]	H [mm]	L [mm]	
BORBASEM250	305	138,5	280	
BORBASEM333PA	365	133,5	175	
BORBASEM333PE	420	138,5	365	

BEFESTIGUNG

ART.-NR.		d [mm]	H [mm]	
MMS5525A2	1.4301 AISI304 INOX	5,5	25	
RIV6320		6,3	20,2	

ARTIKELNUMMERN UND ABMESSUNGEN

SICHERHEITSTOR

ART.-NR.		L [mm]	H [mm]	
BORGATE600	EN AW 5083 H111	600	640	

ZUBEHÖR

ART.-NR.				
BORCAP45		LOPE		
BORCAP32				
BORCAP		PP RECYCLED		
BORCOR				
BORWALL		PP RECYCLED	1.4301 AISI304 INOX	
EPDM253		EPDM		

SAFETY REGULATIONS, INSTRUCTIONS FOR INSTALLATION AND USE

IT

DE

EN

ES

FR

PT

INTRODUCTION

DEFINITION

The **BORDER M** railing is a collective fall protection system, ideal for roof safety, manufactured from aluminium alloy (**EN AW 6005A-T6 and EN AW 6063-T6**) and suitable for installation on roofs with a pitch of up to 10°.

REGULATIONS

The **BORDER M** railing with horizontal fastening complies with the following regulations:

- **EN 14122-3:2016**
- **EN 13374:2025 Cl.A (except point 9)**
- **EN 13374:2013+A1: 2018 Cl.A (except point 9)**
- **NF E85-015:2019 (France)**
- **DGUV 201-056 (Germany)**
- **OSHA 1910.29 (USA)**

The table below summarises the main geometric parameters specified by each standard:

	EN 14122-3: 2016	EN 13374: 2025	EN 13374: 2013 +A1: 2018 Cl.A	NF E85-015: 2019	OSHA 1910.29
Min. height above walking surface	1,1 m	1 m		1 - 1,1 m	0,99 - 1,14 m (39 - 45 in)
Max. spacing between rails	500 mm	470 mm		500 mm	480 mm
Max. spacing between uprights	1,5 m (suggested)	-		1,5 m (suggested)	-
Min. height of toe board	10 cm	15 cm		10 cm	-

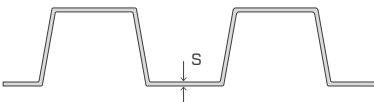
USE - MAINTENANCE

- Before use, carry out a visual inspection to ensure that the **BORDER** railing shows no signs of damage or abnormalities (impact damage, deformation, etc.).
- The **BORDER** railing does not require any specific maintenance; however, a visual inspection must be carried out by a qualified operator at least once a year.
- If the **BORDER** railing has been incorrectly installed, damaged or used to arrest a fall, it must be taken out of service immediately. It must not be reused until written authorisation has been provided by a qualified operator following inspection and verification.
- If the product is resold outside the country of destination, it is essential that the reseller provides the instruction manual in the language of the country where the product will be used. These documents can be provided to you on request by contacting the manufacturer.
- The **BORDER** railing is a permanent collective protective equipment to be used only by professionals on roofs not accessible to the public.
- If installed in a polluted industrial, petrochemical, marine or coastal environment, the **BORDER** railing must undergo a suitable surface treatment, such as powder coating, anodising, etc.
- If necessary, it is recommended that the railing be connected to a lightning protection system in accordance with local regulations. Do not use it as a lightning-conductor grounding line.
- If a layout drawing has been provided, refer to this document during installation.

STORAGE

The raw aluminium components are packed in contact with each other. The action of rain, on the closed package, can facilitate oxidation of these components. In this case, surface staining may occur. These do not compromise the quality of the aluminium but can damage the aesthetic appearance of the railing. It is recommended to unpack the packaging and keep the components separated from one another (with no contact between them), or to store the unopened packages in a dry place.

SUBSTRUCTURES AND FASTENING

MINIMUM REQUIREMENT	MATERIAL	S_{min}
	STEEL	0.4 mm
	ALUMINIUM	0,7 mm

MAIN FORCES ACTING ON THE RIVETS

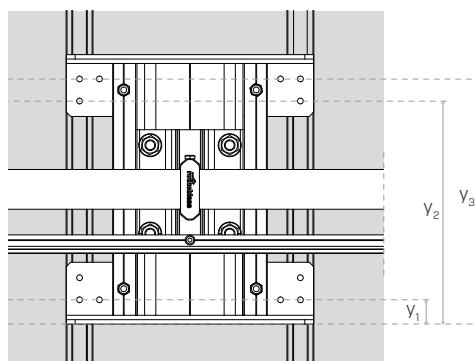
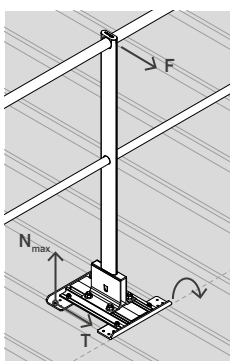
The forces acting on the rivet (tensile and shear) are determined based on the following assumptions:

- rigid flange and linear stress distribution
- lever arm of the applied load equal to the length of the upright (worst case $H = 110$ cm)
- rotation point used to resolve the moment coinciding with the edge of the flange
- maximum spacing and maximum point load at the top of the upright in accordance with the applicable standard.

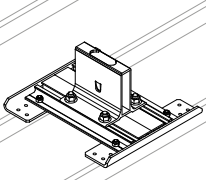
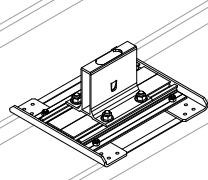
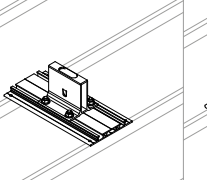
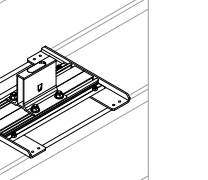
The values given below refer to the load acting on the j-th rivet in the most heavily loaded row relative to the axis of rotation.

$$T = \frac{F}{N_{riv}}$$

$$N = \frac{M_f}{\sum_{j=1}^m n_j \cdot y_j^2} \cdot y_j$$



The most heavily loaded row is the one corresponding to the y_3 axis.

		BORBASEM250	BORBASEM250	BORBASEM333PA	BORBASEM333PE
					
T [N]	EN 14122-3: 2016 DGUV 201-056*	131,3	131,3	131,3	116,4
N_{max} [N]		515,2	515,2	398,2	371,4
T [N]	EN 13374: 2025 DGUV 201-056*	91,7	91,7	91,7	91,7
N_{max} [N]		359,8	359,8	278,1	292,5
T [N]	NF E85-015: 2019	154,7	154,7	154,7	137,2
N_{max} [N]		607,2	607,2	469,3	437,7
T [N]	OSHA 1910.29	148,3	148,3	148,3	148,3
N_{max} [N]		582,3	582,3	450,0	473,3

* DGUV 201-056: available both as a permanent (EN 14122) and temporary (EN 13374) railing configuration.

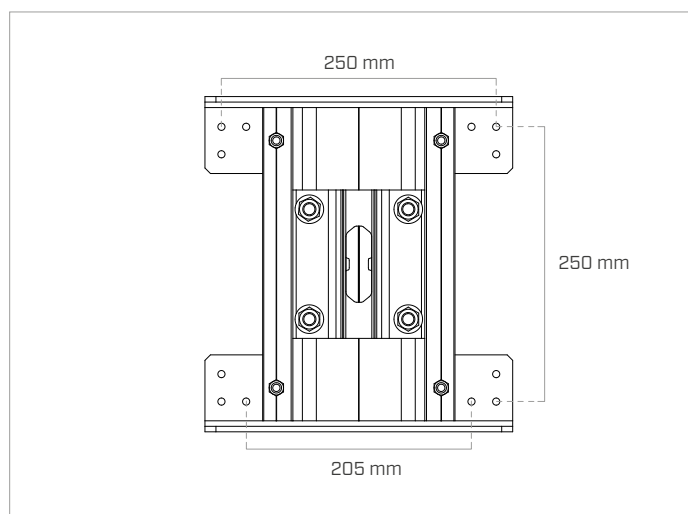
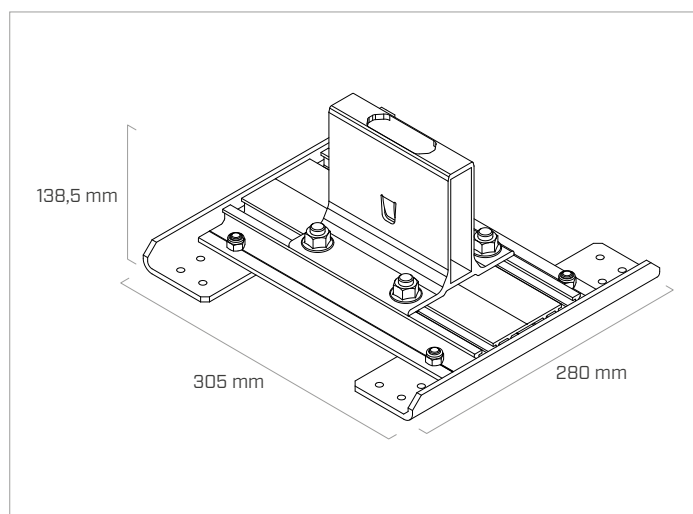
TOOLS



BASE TYPES

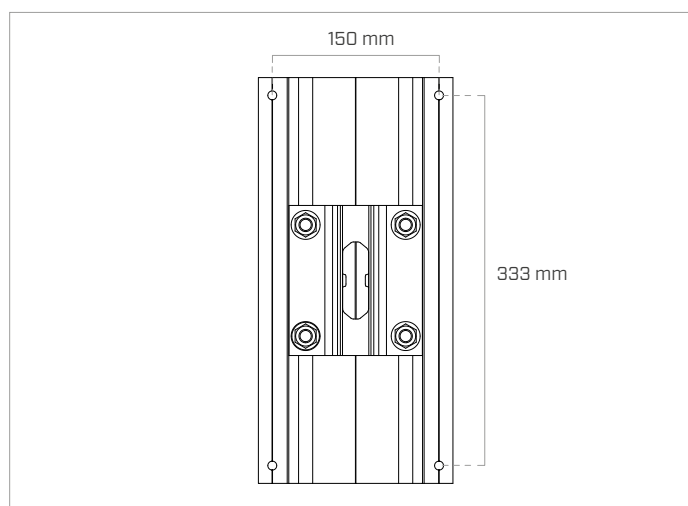
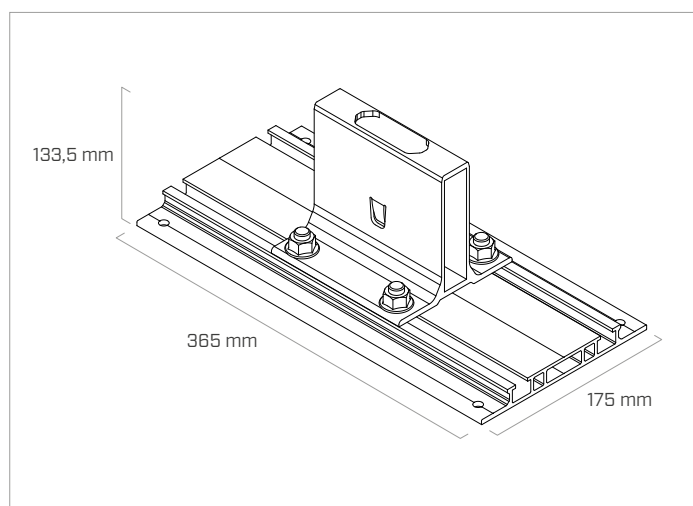
BORBASEM250

Universal base on trapezoidal sheet metal, installed parallel and perpendicular to the ribs. Suitable for a rib spacing of 250 mm.



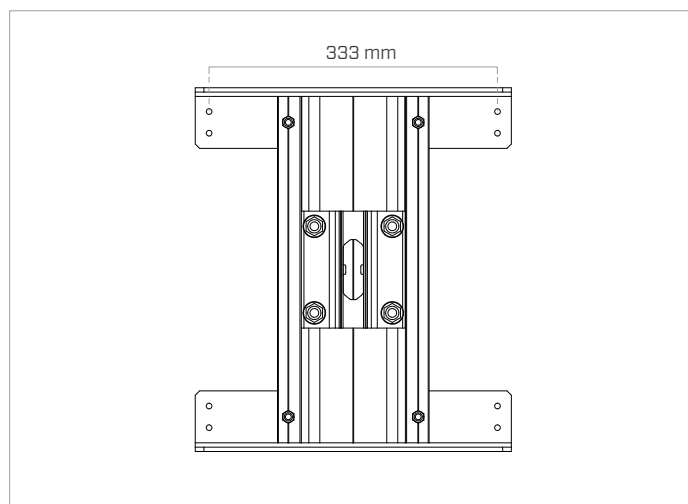
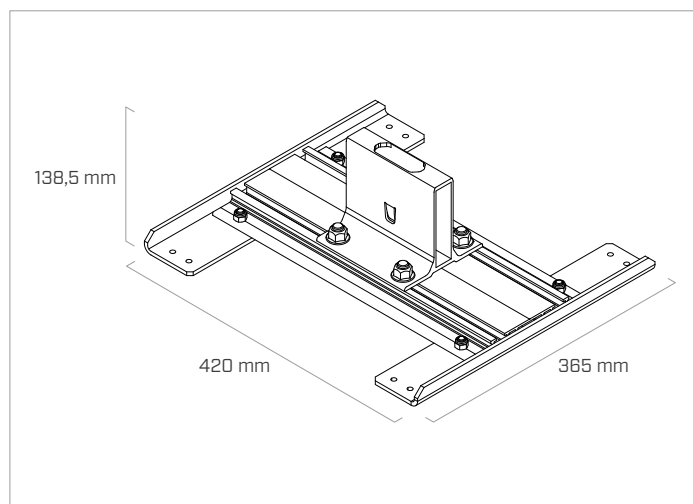
BORBASEM333PA

Base on trapezoidal sheet metal, installed parallel to the ribs. Suitable for a rib spacing of 333 mm.



BORBASEM333PE

Base on trapezoidal sheet metal, installed perpendicular to the ribs. Suitable for a rib spacing of 333 mm.



BASE FIXING AND INSTALLATION

The railing on trapezoidal sheet metal is secured using RIV6320 rivets (Ø 6.3 x 20 mm – ETA-25/1169), with integrated sealing washers and EPDM253 single-sided adhesive tape (25 x 3 mm, 20 m roll) to ensure watertightness of the fastening assembly to the metal substructure.



FASTENING TOOL:
Battery-operated riveting machine

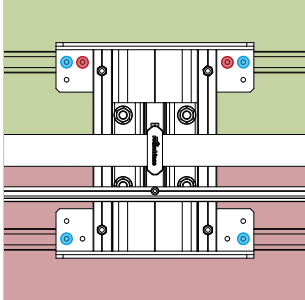
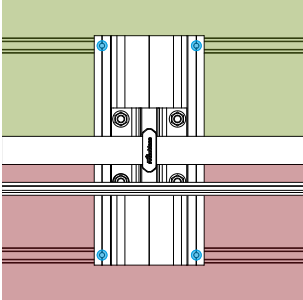
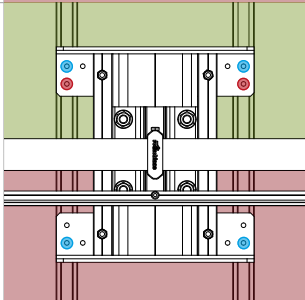
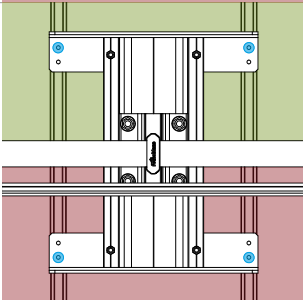
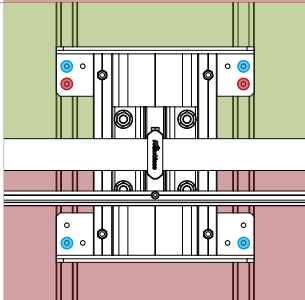
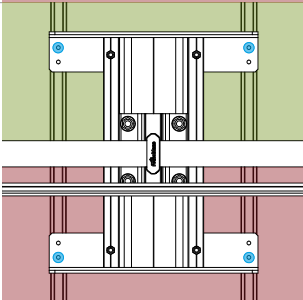
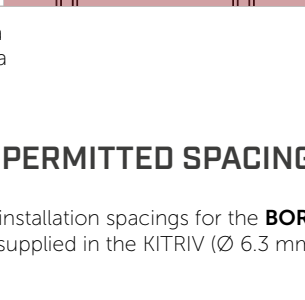
BEFORE FASTENING	AFTER FASTENING
RIV6320 rivet M base plate EPDM253 single-sided adhesive tape Trapezoidal sheet metal	

INSTALLATION VIDEO

Table 1

upright	upright types	H _{uprights}
BORUP100/R	straight and curved	100 cm
BORUP110/R		110 cm
BORUP113C		110 cm
BORUP100F	folding	100 cm
BORUP110F/R		110 cm
BORUP107US	straight	107 cm

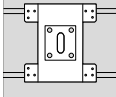
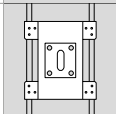
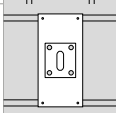
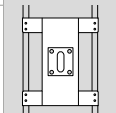
POSITION OF RIVETS ON PLATE

CONFIGURATION		SUBSTRUCTURE NO. OF RIVETS	CONFIGURATION		SUBSTRUCTURE NO. OF RIVETS
250 mm rib spacing parallel		STEEL 4 ●	333 mm rib spacing parallel		STEEL/ ALUMINUM 4 ●
		ALUMINIUM 4 ● + 2 ●			
250 mm rib spacing perpendicular		STEEL 4 ●	333 mm rib spacing perpendicular		STEEL/ ALUMINUM 4 ●
		ALUMINIUM 4 ● + 2 ●			

Internal area
External area

TABLE OF PERMITTED SPACINGS [Table 1 - Spacings]

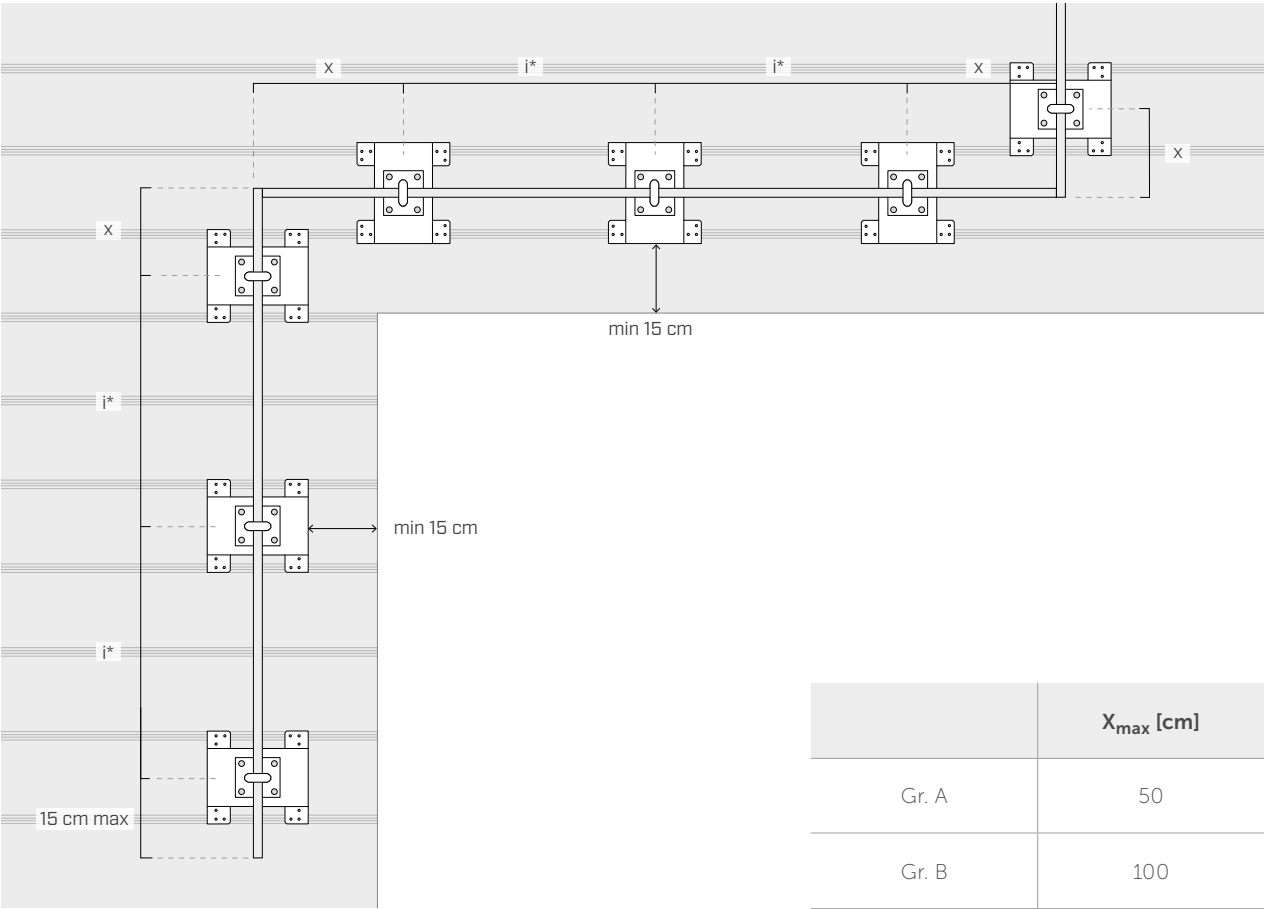
The maximum installation spacings for the **BORDER M** railing are shown below.
Only the rivets supplied in the KITRIV (Ø 6.3 mm) must be used for fastening.

			Gr. A	Gr. B
TYPE			EN 14122-3: 2016 NF E 85-015: 2019 DGVV 201-056* OSHA 1810.29	EN 13374 cl. A DGVV 201-056*
BORDER M	250 mm rib spacing parallel		150	250
	250 mm rib spacing perpendicular		150	250
	333 mm rib spacing parallel		150	250
	333 mm rib spacing perpendicular		133	233

* DGVV 201-056: available both as a permanent (EN 14122) and temporary (EN 13374) railing configuration.

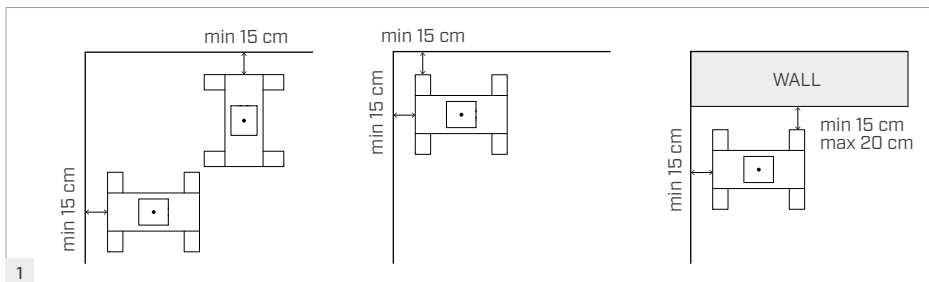
RAILING ASSEMBLY DIAGRAM

For all **BORDER M** railing configurations, the following installation criteria must be observed:

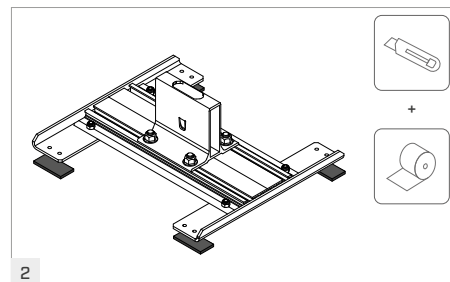


i: reference spacings according to Table 1 - Spacings (page 9)

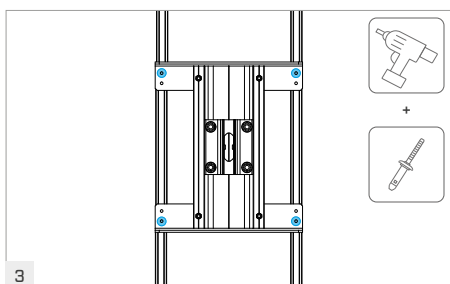
RAILING INSTALLATION



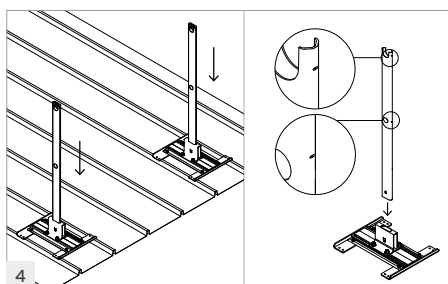
At least two qualified operators are required to install the **BORDER M** railing. For best results, it is advisable to start from a corner.



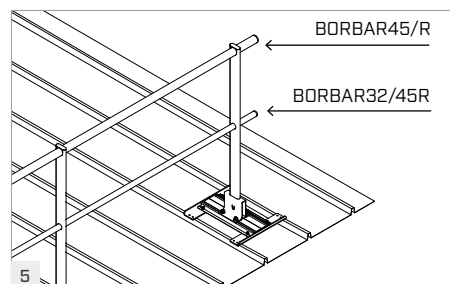
Use **EPDM253** single-sided adhesive tape, cutting the amount required to waterproof the surface beneath the **BORDER M** plate. Apply the tape, ensuring that the connection hole in the plate is completely covered by the **EPDM**.



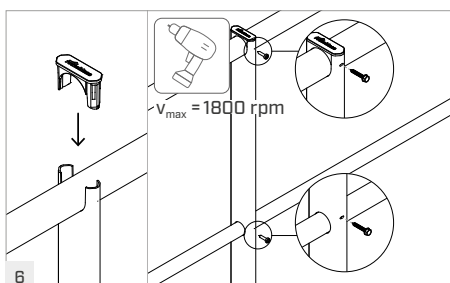
Position the **M** plates in accordance with the applicable standard, then secure the **BORBASEM** plate to the substructure using the number of fastenings specified in the table (tab. 1, page 9).



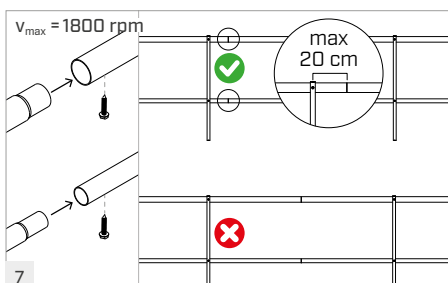
Insert the uprights into the **BORBASEM** plates with the markings facing the operator. Check that the tabs and slots are properly interconnected. No screws are required for fastening. To remove the base-upright assembly, push the base upwards. If there are screws, remove them and drill Ø6 mm at the countersunk hole.



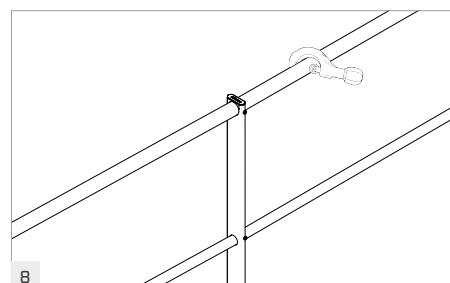
Insert the **BORBAR32** intermediate rail followed by the **BORBAR45** top rail. In compliance with **EN 13374**, the **BORBAR45R** reinforced rails must be installed.



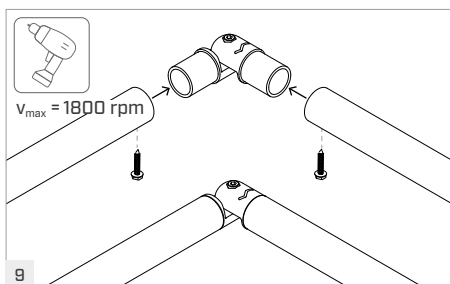
Insert the **BORCAP** cap on the top of each upright. Secure the rails to the uprights using screws **MMS5525A2** at the two side markings.



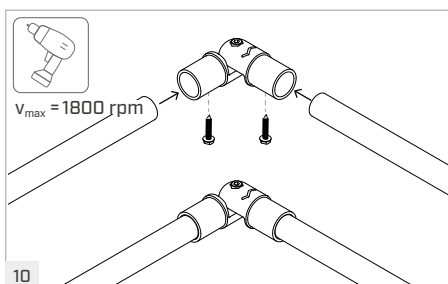
Connect the male/female ends of the handrail and rails, fastening them with screws **MMS5525A2**. In compliance with **EN 14122**, the handrail must end no more than 20 cm from the nearest upright. Position the screws under the rails.



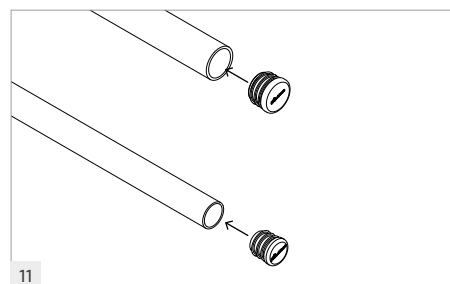
Adapt the final section of the railing by cutting off the excess length of the rails as indicated in the diagram on page 10.



Insert the **BORCOR** corner joint into the handrail and fasten with self-tapping screws **MMS5525A2**.



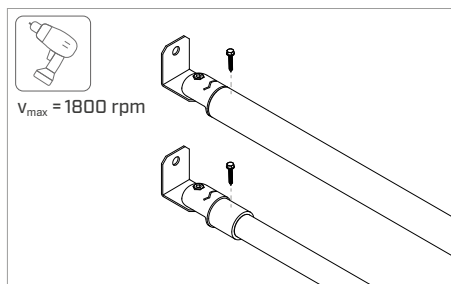
Insert the **BORCOR** corner joint into the outside of the intermediate rail and secure with **MMS5525A2** self-tapping screws.



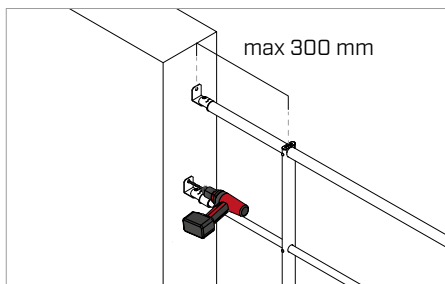
Insert the **BORCAP45** and **BORCAP32** caps into the handrails or intermediate rails respectively.

INSTALLATION

BORWALL

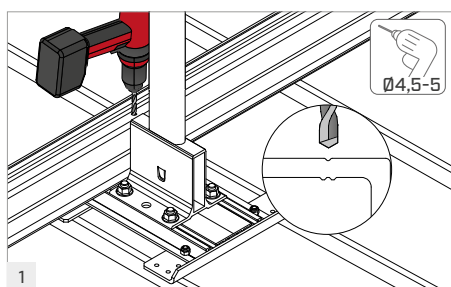


Insert the handrail and intermediate rail into the **BORWALL** wall end element and secure with an **MMS5525A2** self-tapping screw.

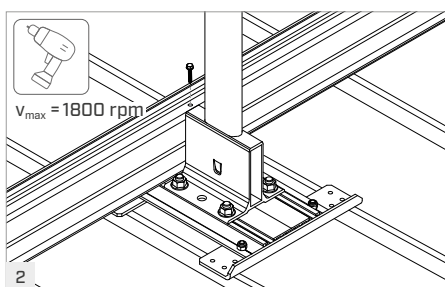


Ensure a maximum distance of **300 mm** from the wall. Drill the wall with a Ø10 mm bit and fasten the end element with an M10 anchor (AB110115), or on timber using VGS Ø9 (VGS9100 + HUS8).

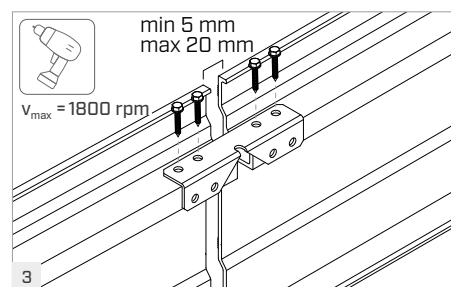
BORTB



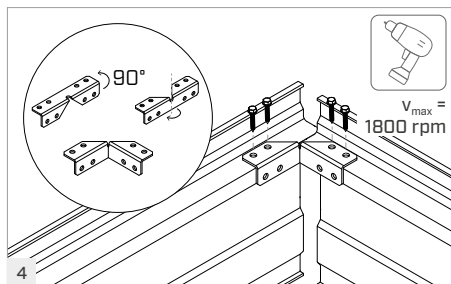
Position the **BORTB** so that its support rests against the shoulder of the **BORBASEM** base. Drill a Ø 5 mm through pilot hole. Use the channel on the support as a guide for the screwdriver bit.



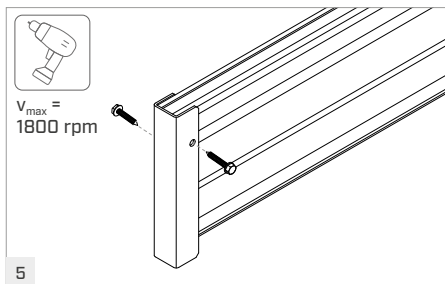
Once the pilot hole has been drilled, the toe board can be secured to the base with a screw **MMS5525A2**.



Join the ends of **BORTB** with the **BORTBJUN** connector. Fasten with 4 screws **MMS5525A2**, leaving at least 5 mm between boards to prevent thermal deformation.



At the corners, manually rotate and bend the **BORTBJUN** connector until the desired angle is achieved. Fasten with 4 self-tapping screws **MMS5525A2**.



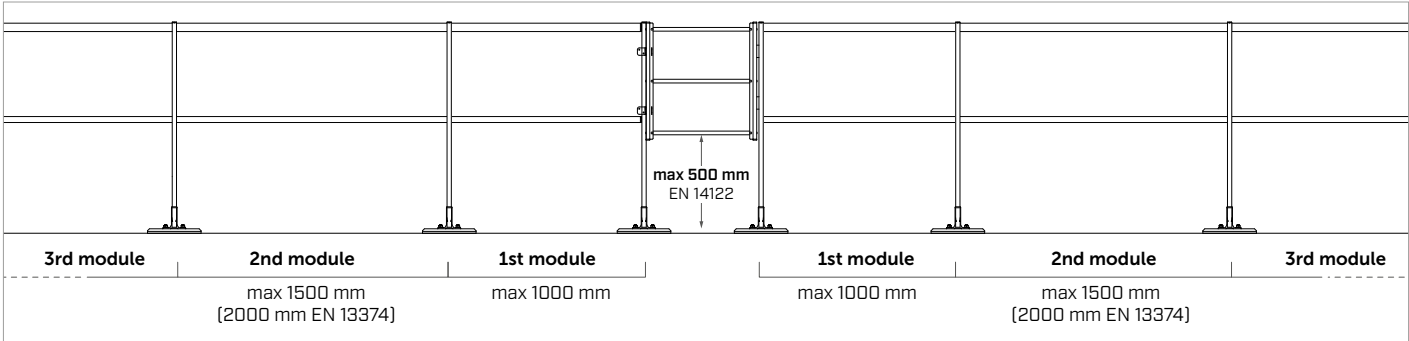
Fasten the end caps of the toe board with 2 self-tapping screws **MMS5525A2**.

GATE INSTALLATION
BORGATE600

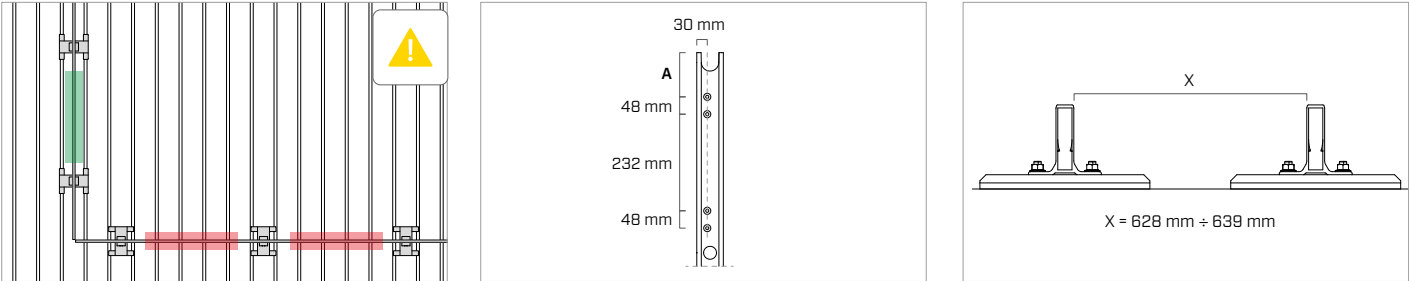
Table with 4 columns and 1 row containing various EN and DGV standards (EN 13374: 2025, EN 13374: 2013, EN 13374: 2025, DGV 201-056).

The BORGATE600 gate must be installed in compliance with the minimum system stability requirements. At least three uprights must therefore be installed on each side, observing the following maximum spacing:

- 1st module: 1000 mm max
- 2nd module: 1500 mm max (for EN 14122-3) - 2000 mm max (for EN 13374)
- 3rd module: as specified in Table 1 – Spacings



The bottom edge of the gate must be less than 500 mm from the walking surface, as specified by EN 14122-3. Check the maximum distance permitted by the applicable standard (e.g. EN 13374: maximum gap 470 mm).



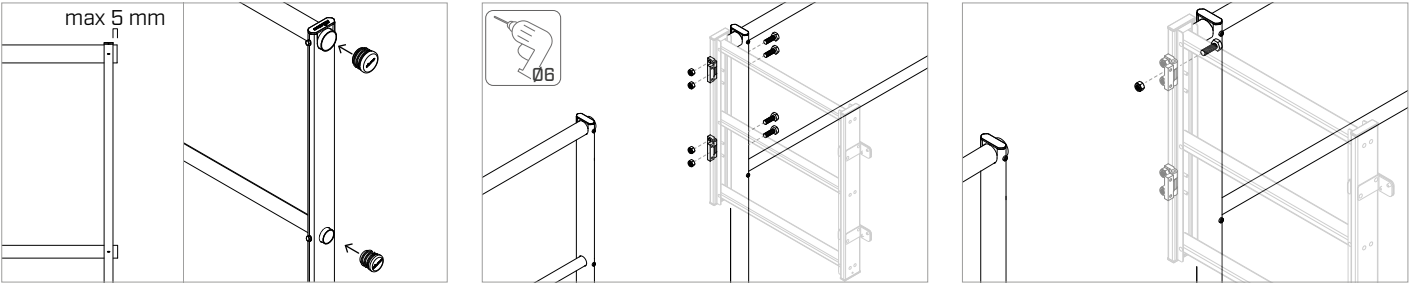
The gate may only be installed on railings fixed to trapezoidal sheet metal or sandwich panels when the system is installed parallel to the direction of the ribs. When the railing is installed perpendicular to the ribs, the gate cannot be installed.

- Mark the dimensions shown in the drawing⁽¹⁾ on the upright and drill:
- no. 4 Ø 6.5 mm holes on the gate side;
 - no. 4 Ø 18 mm (min.) holes on the outer side.

⁽¹⁾ Value A is determined according to the required design heights (see table below).

Secure the BORBASEM plates to the supporting surface, ensuring a centre-to-centre distance x between 628 mm and 639 mm.

Table with 6 columns: H upright [cm], Value A [mm] (EN 14122-3: 2016, DGV 201-056), Value A [mm] (EN 13374: 2025, EN 13374: 2013, EN 13374: 2013 + A1: 2018, DGV 201-056), NF E85-015: 2019, and DSHA 1910.29. Rows show different gate configurations (straight/folding, straight + folding) and their corresponding dimensions.



Position the rails so that they do not protrude more than 5 mm beyond the side of the upright. If necessary, cut off the excess. Then fit the cap specified for the type of tube used.

Install the gate using the M6 screws and self-locking nuts supplied in the bag provided.

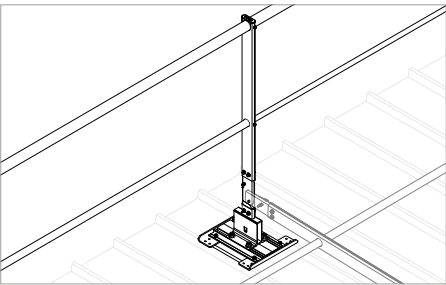
To limit the sail effect of the gate in windy conditions or during periods of non-use, an additional M10 screw (not supplied) may be installed to lock the gate permanently in the closed position.

FOLDING RAILING INSTALLATION

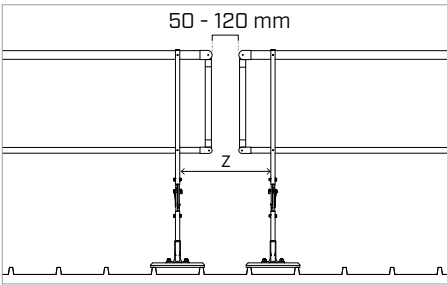
BORUP100F - BORUP110F

The procedure described above also applies to the installation of folding railings. However, the following additional instructions must be observed:

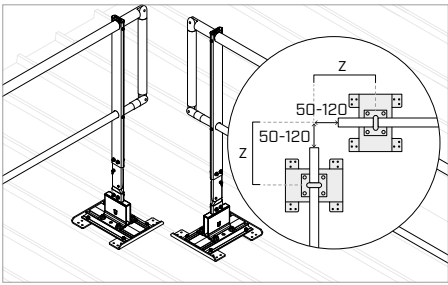
EN 13374: 2025 CIA	EN 13374: 2019 +A1: 2018 CIA	EN 14122-3: 2018	NF E85-015: 2019
--------------------------	------------------------------------	------------------------	------------------------



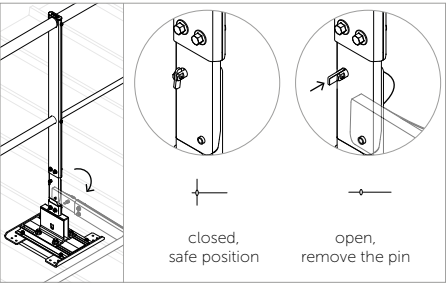
BORDER M folding railings must be installed on the joint side (not the pin side), so that the upright folds towards the roof and never outwards.



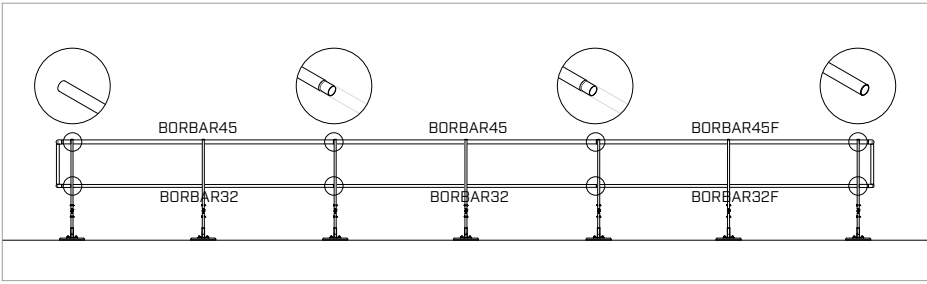
BORDER M folding railings are installed in 9 m modules (7 connected uprights) or 12 m modules (9 connected uprights). Install two end uprights with the following maximum distances:
BORBASEM250: $z_{max} = 500$ mm
BORBASEM333PE/PA: $z_{max} = 666$ mm
Also maintain a distance of between 50 and 120 mm between the **BORBARENDF** vertical end rails.



Install two end uprights with the following maximum distances:
BORBASEM250: $z_{max} = 250$ mm
BORBASEM333PE/PA: $z_{max} = 350$ mm
Also maintain a distance of between 50 and 120 mm between the **BORBARENDF** vertical end rails.



To fold down the entire railing, remove the pins from their respective housings.



The main rails to be used are the **BORBAR45** and the **BORBAR32**; regardless, each module must end with the specific **BORBAR45F** and **BORBAR32F** rails with no reduction.

	EN 14122-3: 2018 DVGU 201-056	EN 13374: 2025 CIA EN 13374: 2019 +A1: 2018 CIA DVGU 201-056	NF E85-015: 2019	OSHA 1910.29
Upright H = 110 cm	BORUP110F	BORUP110FR	BORUP110F	N/A
Upper rail	BORBAR45/F	BORBAR45R*	BORBAR45/F	N/A
Intermediate rail	BORBAR32/F	BORBAR45R*	BORBAR32/F	N/A
Upright H = 100 cm	N/A	N/A	BORUP100F	N/A
Upper rail	N/A	N/A	BORBAR45/F	N/A
Intermediate rail	N/A	N/A	BORBAR32/F	N/A

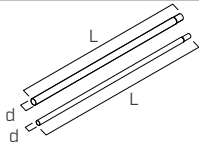
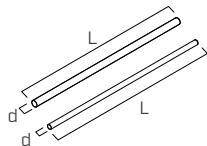
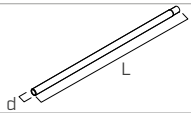
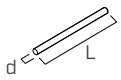
* For end rails in EN 13374 applications, the excess length must be cut.

GENERAL WARNINGS FOR USE

- Before folding down the railing, ensure that the operator is in a safe working condition. The user must be secured to a fall arrester, such as a **PA-TROL** lifeline or a **KITE** anchor point. It is also necessary to check that all tools and equipment are in proper working order and that the installation area is clear of obstacles.
- The 9 m modules can be handled by a single operator. The 12 m modules require an additional operator to ensure correct folding.

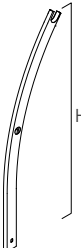
CODES AND DIMENSIONS

RAILS

CODE	d [mm]	L [mm]	
BORBAR45	45	3000	
BORBAR32	32	3000	
BORBAR45F	45	3000	
BORBAR32F	32	3000	
BORBAR45R	45	3000	
BORBARENDF	45	417	

EN AW
6063-T6

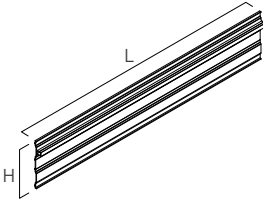
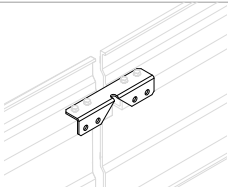
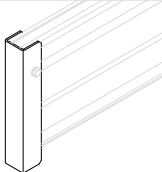
UPRIGHTS

CODE	H [mm]	
BORUP530WH	535	
BORUP760WH	765	
BORUP100	1005	
BORUP110	1105	
BORUP118	1185	
BORUP130	1305	
BORUP100F	1005	
BORUP110F BORUP110FR	1105	
BORUP113C	1120	
BORUP100R	1005	
BORUP110R	1105	
BORUP107US	1075	

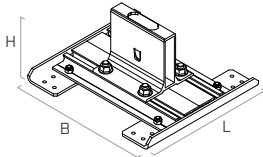
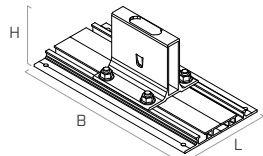
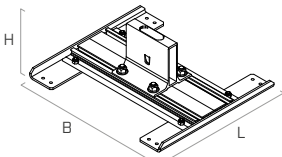
EN AW
6005A-T6

CODES AND DIMENSIONS

TOE BOARD

CODE		H [mm]	L [mm]	
BORTB	EN AW 6063-T6	150	3000	
BORTBJUN	EN AW 6063 H111	-	-	
BORTBCAP	EN AW 6063 H111	-	-	

BASES

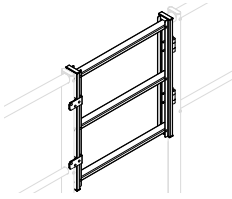
CODE	B [mm]	H [mm]	L [mm]	
BORBASEM250	305	138,5	280	
BORBASEM333PA	365	133,5	175	
BORBASEM333PE	420	138,5	365	

FASTENING

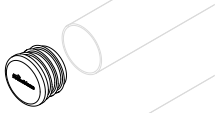
CODE		d [mm]	H [mm]	
MMS5525A2	1.4301 AISI304 INOX	5,5	25	
RIV6320		6,3	20,2	

CODES AND DIMENSIONS

SAFETY GATE

CODE		L [mm]	H [mm]	
BORGATE600	EN AW 5083 H111	600	640	

ACCESSORIES

CODE			
BORCAP45			
BORCAP32	LDPE		
BORCAP	PP RECYCLED		
BORCOR			
BORWALL	PP RECYCLED	1.4301 AISI304 INOX	
EPDM253	EPDM		

NORMAS DE SEGURIDAD E INSTRUCCIONES DE USO E INSTALACIÓN

INTRODUCCIÓN

DEFINICIÓN

La baranda **BORDER M**, realizada en aleación de aluminio (**EN AW 6005A-T6 y EN AW 6063-T6**), es un sistema de protección colectiva anticaída, que se puede instalar en cubiertas con inclinaciones de hasta 10°, siendo ideal para garantizar la seguridad en ellas.

NORMAS

La baranda de fijación horizontal **BORDER M** es conforme a las siguientes normativas:

- **EN 14122-3:2016**
- **EN 13374:2025 CL.A (salvo punto 9)**
- **EN 13374:2013+A1:2018 CL.A (salvo punto 9)**
- **NF E85-015:2019 (Francia)**
- **DGUV 201-056 (Alemania)**
- **OSHA 1910.29 (EE. UU.)**

En la siguiente tabla se indican los principales parámetros geométricos previstos por cada norma:

	EN 14122-3: 2016	EN 13374: 2025 EN 13374: 2013 +A1: 2018 C.L.A	NF E85-015: 2019	OSHA 1910.29
Altura mínima desde la superficie de pisoteo	1,1 m	1 m	1 - 1,1 m	0,99 - 1,14 m (39 - 45 in)
Intereje máximo entre barras	500 mm	470 mm	500 mm	480 mm
Intereje máximo entre montantes	1,5 m (recomendado)	-	1,5 m (recomendado)	-
Altura mínima del rodapié	10 cm	15 cm	10 cm	-

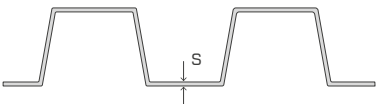
USO - MANTENIMIENTO

- Antes de usar la baranda **BORDER**, hay que inspeccionarla visualmente para asegurarse de que no presente ninguna anomalía (golpes, deformaciones, etc.).
- La baranda **BORDER** no requiere mantenimiento especial; sin embargo, es necesario que un operario cualificado realice un control visual al menos una vez al año.
- Si la baranda **BORDER** se instala de manera incorrecta, está dañada o se ha utilizado para detener una caída, se debe dejar de usar de inmediato. No se puede volver a utilizar hasta que un operario cualificado haya realizado las debidas inspecciones y comprobaciones y haya autorizado su uso por escrito.
- Si el producto se revende fuera del país de destino, es esencial que el distribuidor suministre el manual de instrucciones en el idioma del país donde vaya a usarse el producto. Si se solicita, estos documentos los puede proporcionar el fabricante.
- La baranda **BORDER** es un equipo de protección colectiva permanente que debe ser utilizado exclusivamente por profesionales en cubiertas no accesibles al público.
- Si se instala en un ambiente industrial contaminado, petroquímico, naval o costero, la baranda **BORDER** debe someterse a un tratamiento superficial adecuado, como pintado con pintura en polvo, anodización, etc.
- Si es necesario, se aconseja conectar la baranda a un sistema de protección contra rayos, conforme a las normas locales. No utilizar como toma de tierra del pararrayos.
- Si se proporciona una planimetría, se ruega consultarla durante la instalación.

ALMACENAMIENTO

Los componentes de aluminio bruto se empaquetan en contacto entre sí. La exposición del paquete cerrado a la lluvia puede propiciar la oxidación de los componentes. En este caso, es posible que aparezcan manchas superficiales. Estas manchas no afectan la calidad del aluminio, pero pueden perjudicar el aspecto estético de la baranda. Se aconseja desembalar los componentes y guardarlos separados (sin contacto entre ellos) o bien guardar los componentes empaquetados en un lugar seco.

SUBESTRUCTURAS Y FIJACIONES

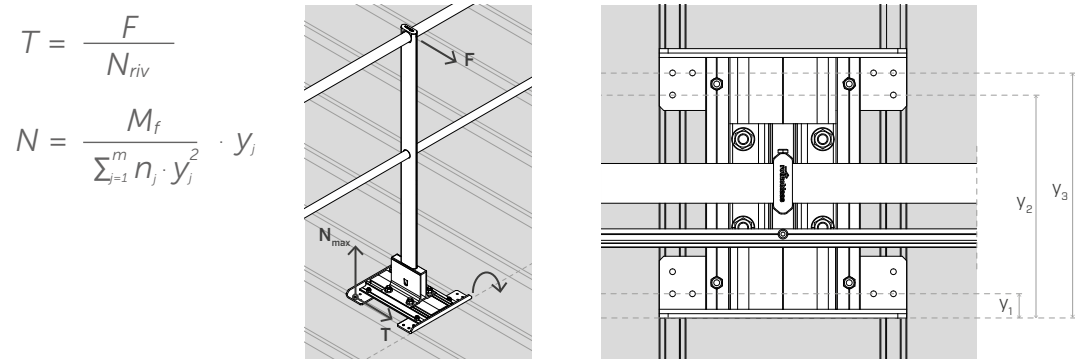
REQUISITO MÍNIMO	MATERIAL	S_{min}
	ACERO	0,4 mm
	ALUMINIO	0,7 mm

PRINCIPALES FUERZAS QUE ACTÚAN EN LOS REMACHES

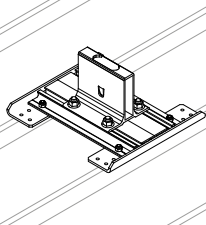
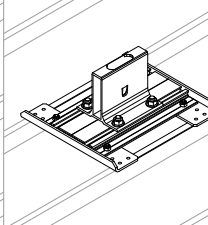
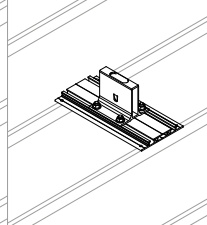
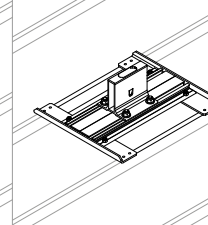
Las fuerzas que actúan en el remache (tracción y corte) se determinan asumiendo los siguientes supuestos:

- brida rígida y distribución lineal de las fuerzas
- brazo de la acción igual a la longitud del montante (peor caso $H = 110 \text{ cm}$)
- punto de rotación para descomponer el momento coincidente con el borde de la brida
- intente máximo y fuerza puntual máxima en la parte superior del montante para la normativa aplicable.

Los valores indicados a continuación se refieren a la sollicitación del j -ésimo remache de la fila más sollicitada con respecto al eje de rotación.



La fila más sollicitada es la correspondiente al eje y_3 .

		BORBASEM250	BORBASEM250	BORBASEM333PA	BORBASEM333PE
					
T [N]	EN 14122-3: 2016 DGUV 201-056*	131,3	131,3	131,3	116,4
N_{max} [N]		515,2	515,2	398,2	371,4
T [N]	EN 13374: 2025 DGUV 201-056*	91,7	91,7	91,7	91,7
N_{max} [N]		359,8	359,8	278,1	292,5
T [N]	NF E85-015: 2019	154,7	154,7	154,7	137,2
N_{max} [N]		607,2	607,2	469,3	437,7
T [N]	OSHA 1910.29	148,3	148,3	148,3	148,3
N_{max} [N]		582,3	582,3	450,0	473,3

* DGUV 201-056: disponible tanto en configuración de baranda permanente (EN 14122) como de baranda temporal (EN 13374).

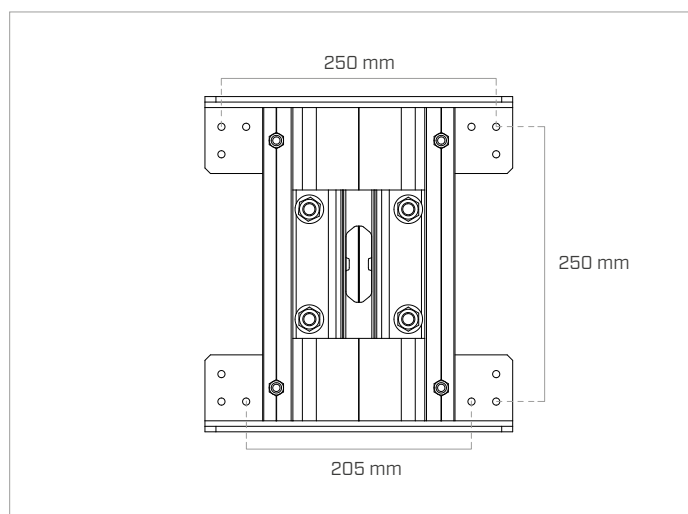
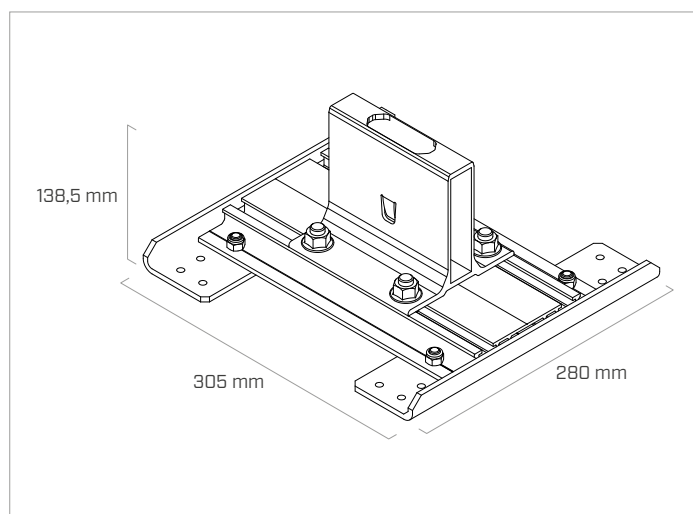
HERRAMIENTAS



TIPOS DE BASES

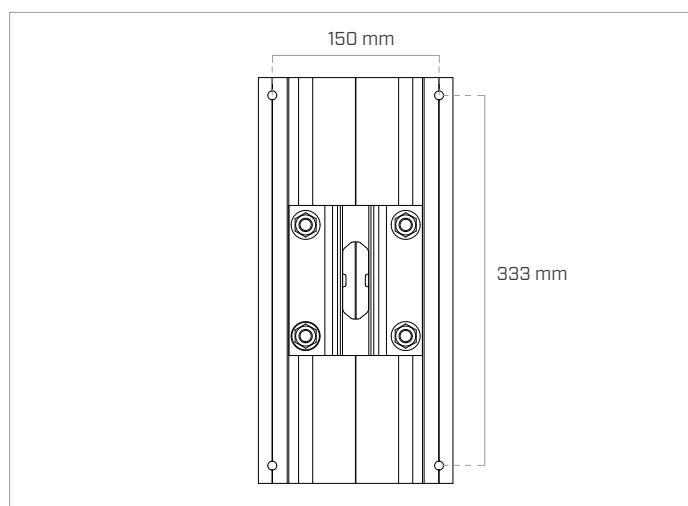
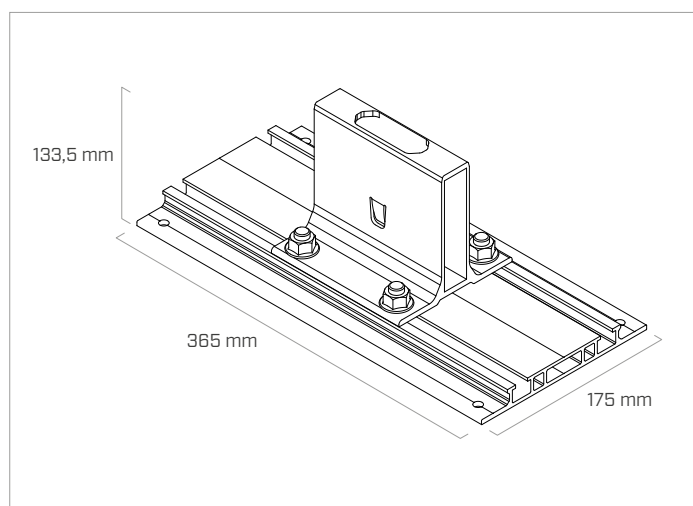
BORBASEM250

Base universal sobre chapa trapezoidal en dirección paralela y perpendicular a las grecas. Se puede adaptar a un interjeje de las grecas de 250 mm.



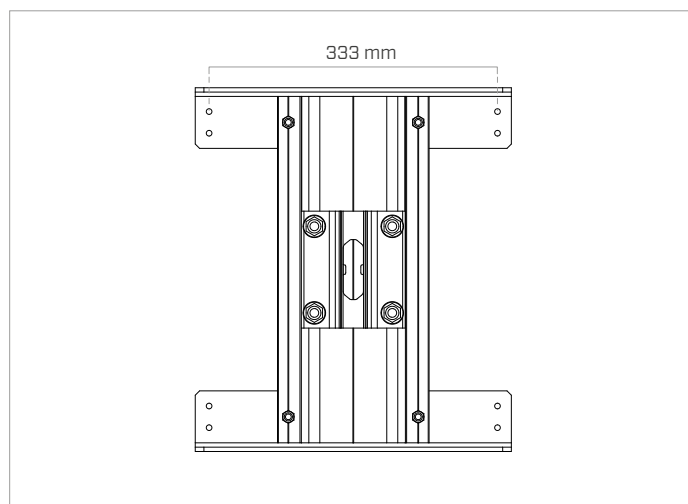
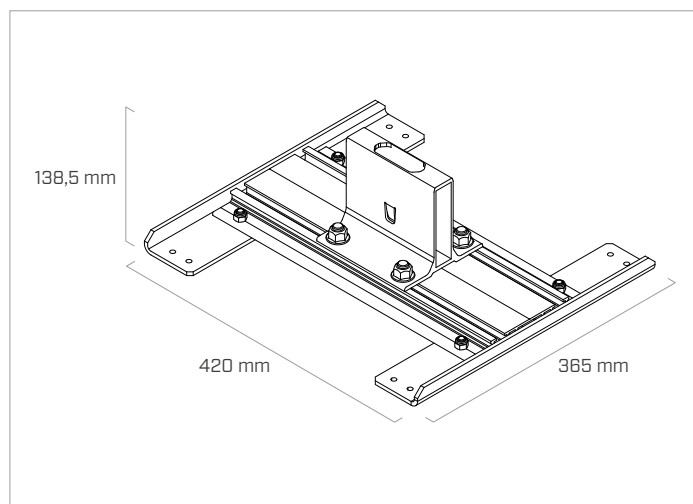
BORBASEM333PA

Base sobre chapa trapezoidal en dirección paralela a las grecas. Se puede adaptar a un interjeje de las grecas de 333 mm.



BORBASEM333PE

Base sobre chapa trapezoidal en dirección perpendicular a las grecas. Se puede adaptar a un interjeje de las grecas de 333 mm.



FIJACIÓN E INSTALACIÓN DE LAS BASES

La baranda sobre chapas trapezoidales se fija mediante remaches RIV6320 (Ø 6,3 x 20 mm – ETA-25/1169), con arandelas de estanquidad integradas y cinta monoadhesiva EPDM253 (25 x 3 mm, rollo de 20 m) para garantizar la impermeabilización del grupo de fijación a la subestructura metálica.



HERRAMIENTA PARA LA FIJACIÓN:
Remachadora de batería

ANTES DE LA FIJACIÓN	DESPUÉS DE LA FIJACIÓN
Remache RIV6320	
Placa base M	
Cinta monoadhesiva EPDM253	
Chapa trapezoidal	

ESPECIFICACIONES DE INSTALACIÓN

Tabla 1

larguero	tipos de montante	H _{montantes}
BORUP100/R	recto y curvo	100 cm
BORUP110/R		110 cm
BORUP113C		110 cm
BORUP100F	abatible	100 cm
BORUP110F/R		110 cm
BORUP107US	recto	107 cm

POSICIÓN DE LOS REMACHES EN LA PLACA

CONFIGURACIÓN		SUBESTRUCTURA N.º REMACHES	CONFIGURACIÓN		SUBESTRUCTURA N.º REMACHES
greca 250 mm paralela		ACERO 4	greca 333 mm paralela		ACERO/ ALUMINIO 4
		ALUMINIO 4 + 2			
greca 250 mm perpendicular		ACERO 4	greca 333 mm perpendicular		ACERO/ ALUMINIO 4
		ALUMINIO 4 + 2			

■ Área interior
■ Área exterior

TABLA DE INTEREJES ADMISIBLES [Tabla 1 - Interejes]

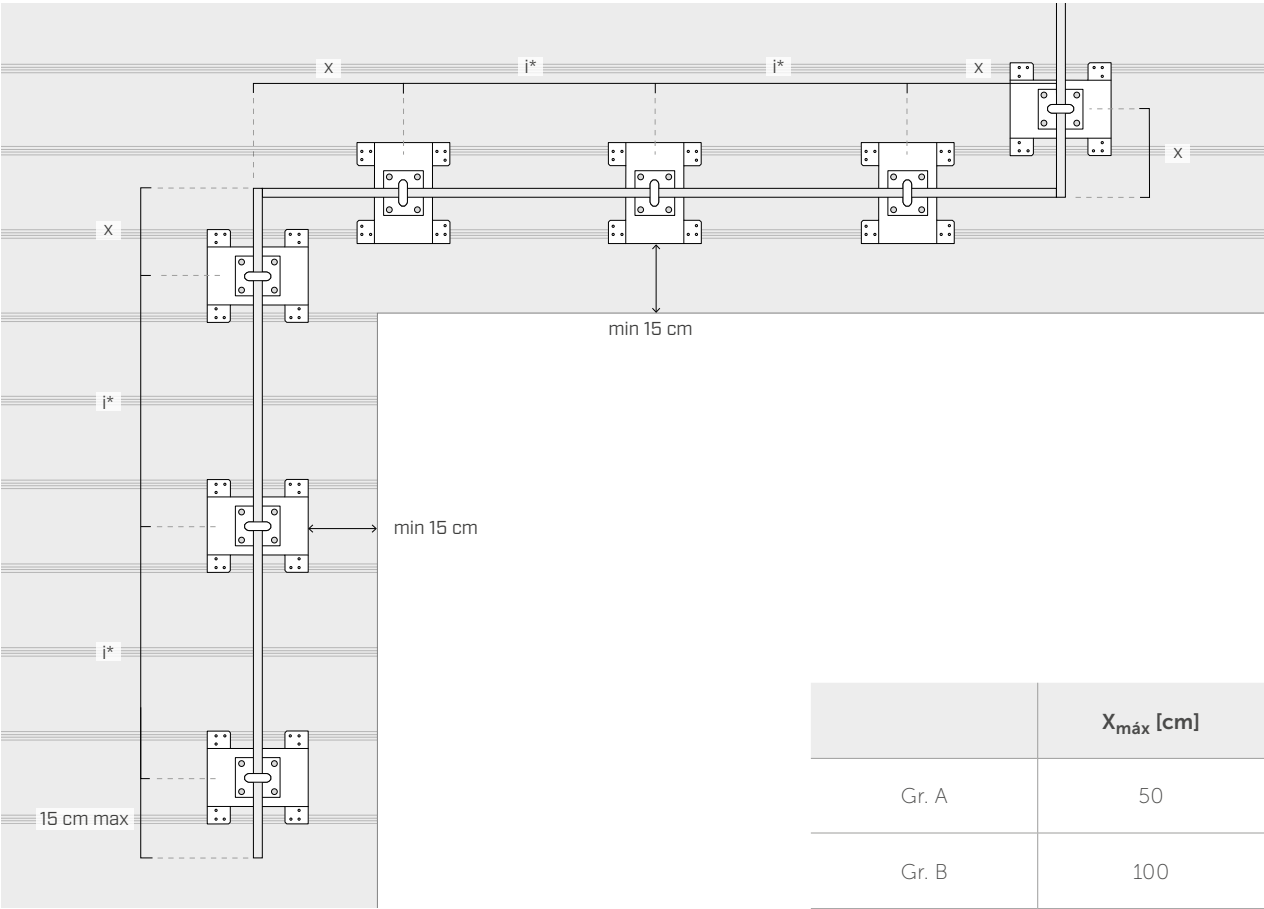
A continuación se indican los intereje máximos de instalación de la baranda **BORDER M**.
Para la fijación se deben utilizar exclusivamente los remaches suministrados en el KITRIV (Ø 6,3 mm).

			Gr. A	Gr. B
TIPO			EN 14122-3: 2016 NF E 85-015: 2019 DGVV 201-056* OSHA 1910.29	EN 13374 cl. A DGVV 201-056*
BORDER M	greca 250 mm paralela		150	250
	greca 250 mm perpendicular		150	250
	greca 333 mm paralela		150	250
	greca 333 mm perpendicular		133	233

* DGVV 201-056: disponible tanto en configuración de baranda permanente (EN 14122) como de baranda temporal (EN 13374).

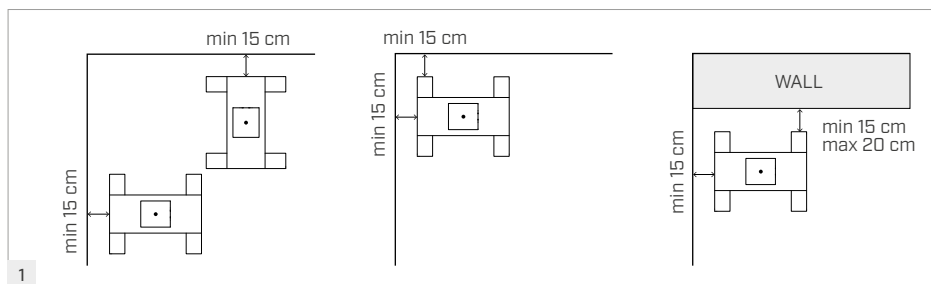
ESQUEMA DE MONTAJE DE LA BARANDA

Para todas las configuraciones de la baranda **BORDER M** es necesario respetar los siguientes criterios de instalación:

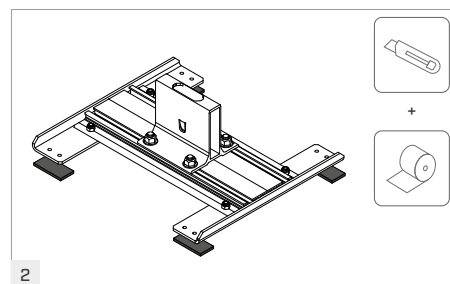


* i: interjes de referencia según la tabla 1 - Interejes (pág. 9)

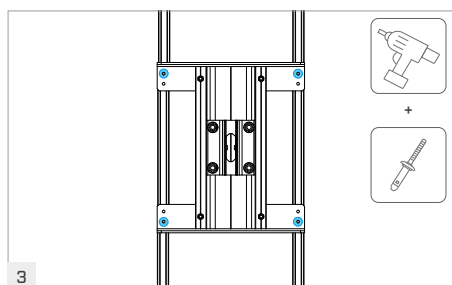
INSTALACIÓN DE LA BARANDA



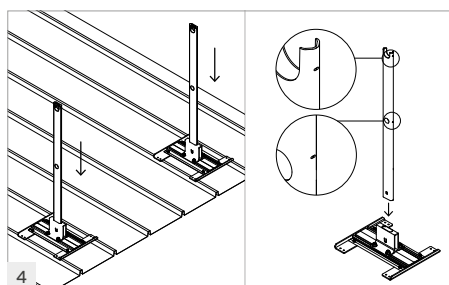
Para instalar la baranda **BORDER M** se requiere la presencia de al menos dos operarios cualificados. Para garantizar un buen resultado, se recomienda empezar por una esquina.



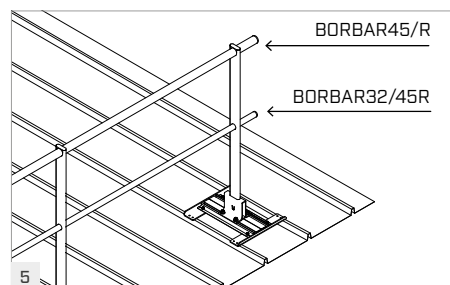
Utilizar cinta monoadhesiva **EPDM253**, cortando la cantidad necesaria para impermeabilizar la superficie de debajo de la placa del **BORDER M**. Aplicar la cinta **EPDM** asegurándose de que cubra completamente el agujero de conexión de la placa.



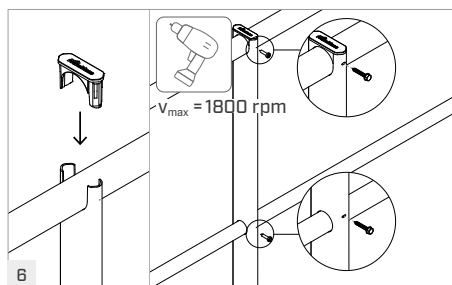
Preparar las placas **M** según la normativa aplicable y, luego, fijar la placa **BORBASEM** a la subestructura con el número de fijaciones indicado en la tabla (tabla 1, pág. 9).



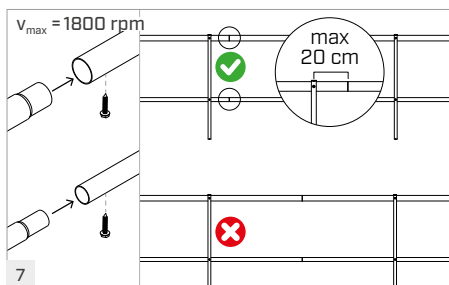
Introducir los montantes en las placas **BORBASEM** con las marcas orientadas hacia el operario. Comprobar que las aletas queden bien encastradas en las correspondientes aberturas. No se necesitan tornillos de fijación. El sistema base-montante se quita empujando la base hacia arriba. Si hay tornillos, quitarlos y realizar un agujero $\varnothing$ 6 mm en el punto del agujero cónico.



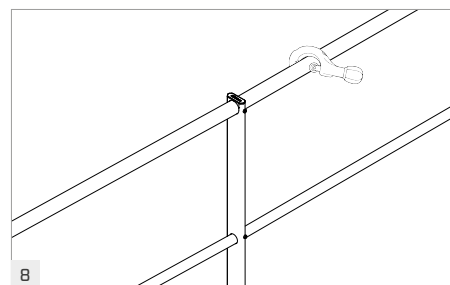
Introducir la barra intermedia **BORBAR32** y, luego, el pasamanos **BORBAR45**. Según la norma **EN 13374**, es necesario instalar los pasamanos reforzados **BORBAR45R**.



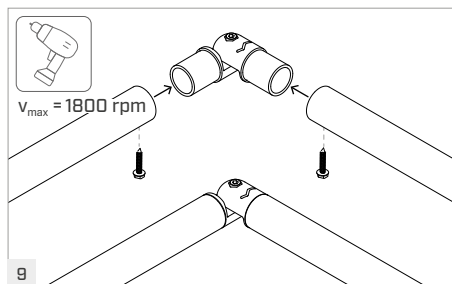
Introducir el tapón **BORCAP** en el extremo superior del montante. Fijar las barras a los montantes con el tornillo **MMS5525A2** en correspondencia de las dos marcas laterales.



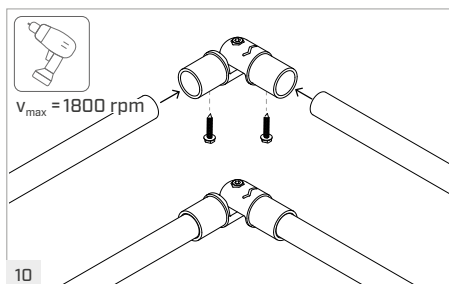
Conectar los extremos macho/hembra de los pasamanos y de las barras y fijarlos con los tornillos **MMS5525A2**. Según la norma **EN 14122**, la conexión del pasamanos debe quedar a no más de 20 cm del montante más cercano. Colocar los tornillos debajo de las barras.



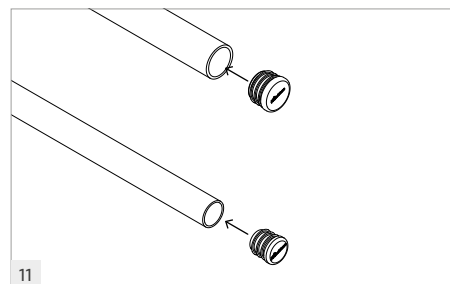
Adaptar la última sección de la baranda, cortando la parte sobrante de las barras según se indica en el esquema de la pág. 10.



Introducir la articulación angular **BORCOR** en el pasamanos y fijarla con los tornillos auto-roscantes **MMS5525A2**.



Acoplar la articulación angular **BORCOR** a la barra intermedia y fijarla con los tornillos auto-roscantes **MMS5525A2**.



Poner los tapones **BORCAP45** y **BORCAP32** respectivamente en los pasamanos y las barras intermedias.

IT

EN

DE

EN

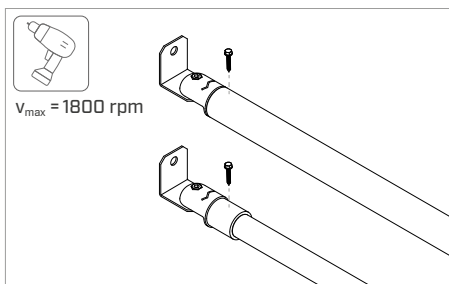
ES

FR

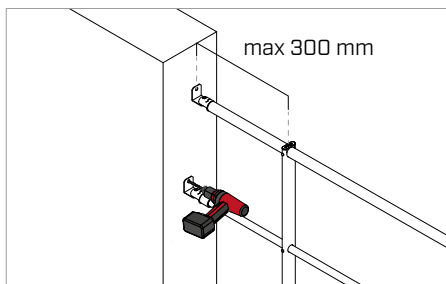
PT

INSTALACIÓN

BORWALL

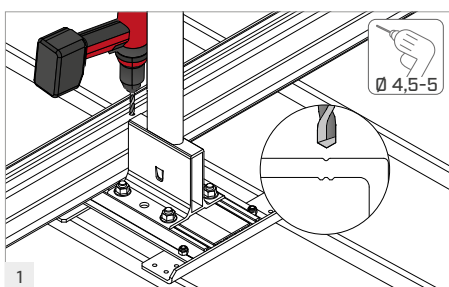


Introducir el pasamanos y la barra intermedia en el elemento terminal de pared **BORWALL** y fijarlos con los tornillos autorroscantes **MM-S5525A2**.

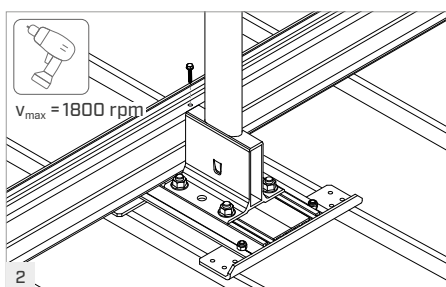


Respetar la distancia máxima de **300 mm** desde la pared. Taladrar la pared con una broca Ø10 mm y fijar el elemento terminal con un taco M10 (AB110115) o, en caso de madera, con VGS Ø9 (VGS9100 + HUS8).

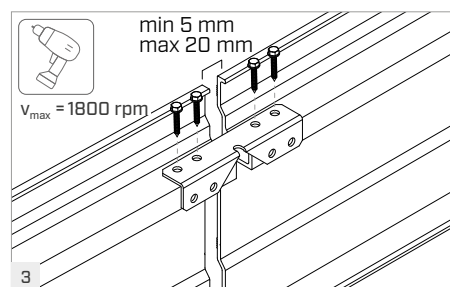
BORTB



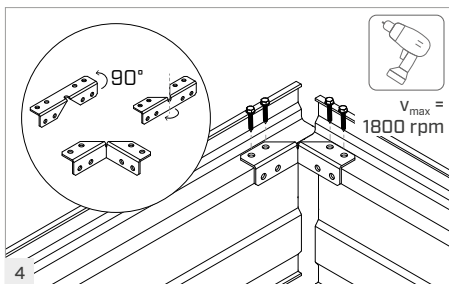
Colocar **BORTB** de manera que su apoyo quede contra el resalte de la base **BORBASEM**. Realizar un pre-agujero pasante Ø 5 mm. Usar la ranura del apoyo como guía para la punta del atornillador.



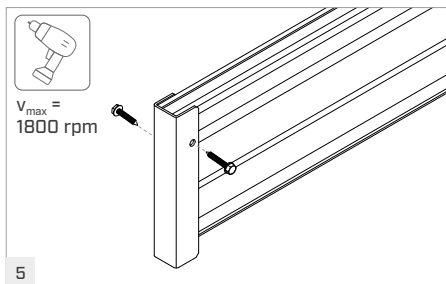
Una vez realizado el pre-agujero, es posible fijar el rodapié a la base con un tornillo **MM-S5525A2**.



Unir los extremos de **BORTB** con el conector **BORTBJUN**. Fijarlo con 4 tornillos **MM-S5525A2**, dejando al menos 5 mm entre los rodapiés para evitar deformaciones térmicas.



En las esquinas, girar y doblar manualmente el conector **BORTBJUN** hasta alcanzar el ángulo deseado. Fijarlo con 4 tornillos autorroscantes **MMS5525A2**.



Fijar los tapones terminales del rodapié con 2 tornillos autorroscantes **MMS5525A2**.

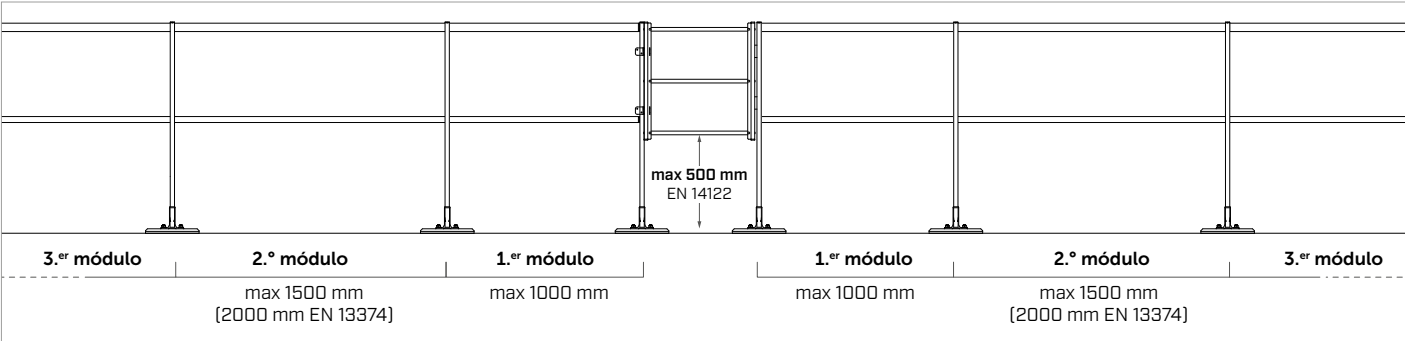
INSTALACIÓN DE LA CANCELA

BORGATE600

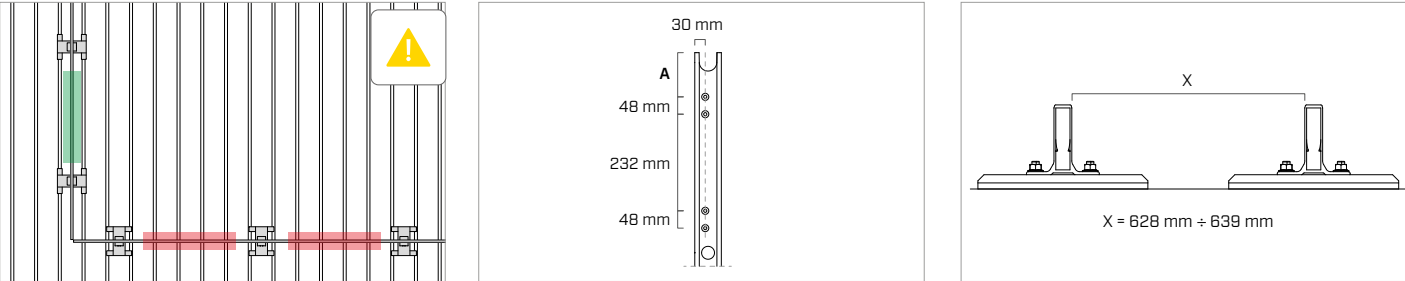
EN 13374: 2025 Cl.A	EN 13374: 2013 +A1: 2018 Cl.A	EN 13374: 2025 Cl.A	DSUV 201-056
---------------------------	-------------------------------------	---------------------------	-----------------

La cancela **BORGATE600** debe instalarse respetando los requisitos mínimos de estabilidad del sistema. Por lo tanto, es necesario instalar al menos tres montantes por lado, respetando los siguientes interejos máximos:

- **1.º módulo:** 1000 mm máx.
- **2.º módulo:** 1500 mm máx. (para EN 14122-3) - 2000 mm máx. (para EN 13374)
- **3.º módulo:** según lo indicado en la tabla 1 – Interejes



⚠ El borde inferior de la cancela debe quedar a menos de **500 mm** de la superficie de pisoteo, como establece la norma EN 14122-3. Comprobar la distancia máxima permitida por la normativa aplicable (por ejemplo, EN 13374: distancia máxima 470 mm).



La cancela solo se puede instalar en barandas fijadas a chapas trapezoidales o paneles sándwich si el sistema se ha colocado paralelamente a la dirección de las greas. Cuando la baranda está instalada perpendicularmente a las greas, no es posible instalar la cancela.

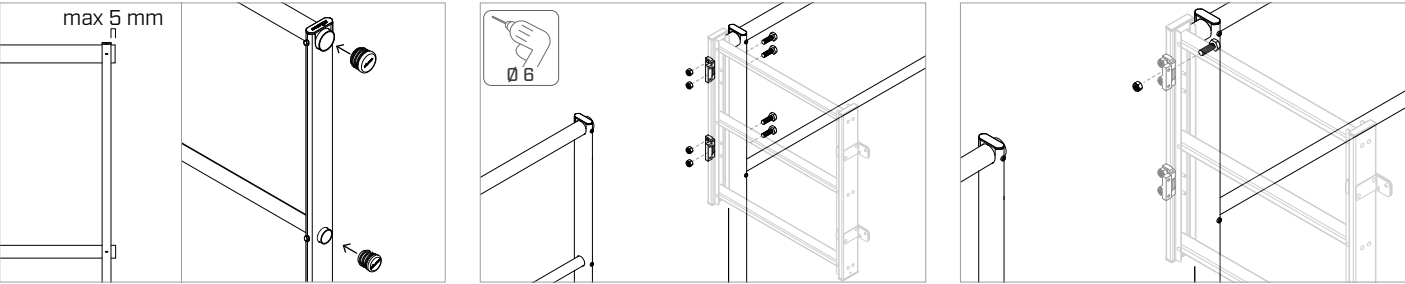
Marcar en el montante las medidas indicadas en el dibujo⁽¹⁾ y realizar:

- **4 agujeros Ø 6,5 mm** lado cancela;
- **4 agujeros Ø 18 mm** (mín.) lado exterior.

⁽¹⁾ El valor A se define en función de las alturas de diseño requeridas (véase siguiente tabla).

Fijar las placas **BORBASEM** al suelo, asegurándose de que el intereje x esté comprendido entre 628 mm y 639 mm.

	H montante [cm]	EN 14122-3: 2016	DSUV 201-056	EN 13374: 2025 Cl.A	EN 13374: 2013 +A1: 2018 Cl.A	DSUV 201-056	NF E85-015: 2019	OSHA 1910.29
		Valor A [mm]		Valor A [mm]				
recto/abatible + greca 250 mm	110	130		160		N/A	N/A	N/A
	100	130		130		N/A	N/A	N/A
recto/abatible + greca 333 mm	110	130		160		N/A	N/A	N/A
	100	130		130		N/A	N/A	N/A



Colocar las barras de manera que no sobresalgan más de **5 mm** con respecto al lateral del montante. Si es necesario, cortar la parte sobrante. Luego, montar el tapón previsto para el tipo de **tubo** utilizado.

Fijar la cancela con los **tornillos M6** y las **tueras autoblocantes** suministradas en la bolsa.

Para limitar **el efecto vela** de la cancela en caso de viento o cuando no se usa, es posible poner un **tornillo M10 adicional** (no suministrado de serie) para bloquear el cierre de manera permanente.

INSTALACIÓN DE LA BARANDA ABATIBLE

EN
13374:2025
CIA

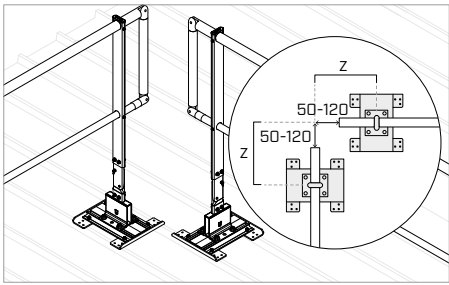
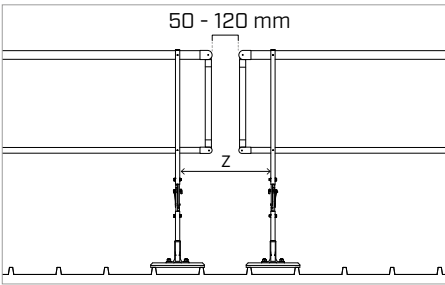
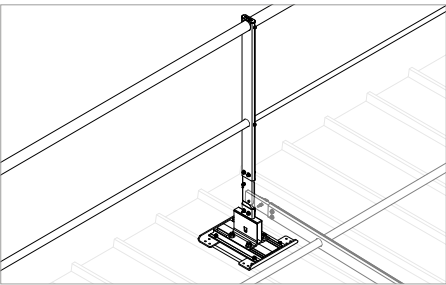
EN
13374:2013
+A1:2018 CIA

EN
14122-3:
2016

NF
E85-015:
2019

BORUP100F - BORUP110F

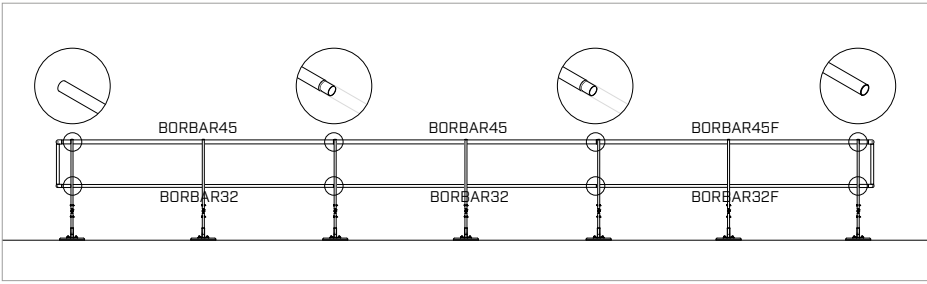
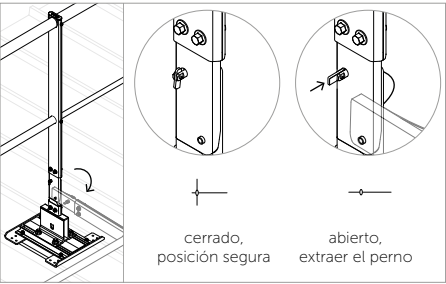
Para instalar barandas abatibles, se aplica el mismo procedimiento descrito anteriormente. Sin embargo, hay que tener en cuenta las siguientes indicaciones adicionales:



Las barandas abatibles para **BORDER M** se deben instalar por el lado de la junta (no por el lado del perno), de manera que el montante se incline hacia el lado de la cubierta y nunca hacia el exterior.

Las barandas abatibles para **BORDER M** se instalan en módulos de 9 m (7 montantes conectados) o 12 m (9 montantes conectados). Instalar dos montantes terminales con las siguientes distancias máximas:
BORBASEM250: $z_{max} = 500$ mm
BORBASEM333PE/PA: $z_{max} = 666$ mm
Además, hay que mantener una distancia comprendida entre 50 y 120 mm entre las barras terminales verticales **BORBARENDF**.

Instalar dos montantes terminales con las siguientes distancias máximas:
BORBASEM250: $z_{max} = 250$ mm
BORBASEM333PE/PA: $z_{max} = 350$ mm
Además, hay que mantener una distancia comprendida entre 50 y 120 mm entre las barras terminales verticales **BORBARENDF**.



Para abatir toda la baranda, extraer los pernos de sus alojamientos.

Las barras principales que se deben usar son la **BORBAR45** y la **BORBAR32**; sin embargo, cada módulo debe terminar con las barras específicas sin reducción **BORBAR45F** y **BORBAR32F**.

	EN 14122-3: 2016	DVGU 201-056	EN 13374:2025 CIA	EN 13374:2013 +A1:2018 CIA	DVGU 201-056	NF E85-015: 2019	OSHA 1910.29
Montante H = 110 cm	BORUP110F		BORUP110FR			BORUP110F	N/A
Pasamanos	BORBAR45/F		BORBAR45R*			BORBAR45/F	N/A
Barra intermedia	BORBAR32/F		BORBAR45R*			BORBAR32/F	N/A
Montante H = 100 cm	N/A		N/A			BORUP100F	N/A
Pasamanos	N/A		N/A			BORBAR45/F	N/A
Barra intermedia	N/A		N/A			BORBAR32/F	N/A

* Para las barras terminales en aplicación EN 13374, es necesario cortar la parte con reducción sobrante.

ADVERTENCIAS GENERALES DE USO

- Antes de abatir la baranda, hay que comprobar que el operario se encuentre en una posición segura. El usuario debe estar sujeto a un dispositivo anticaída, como una línea de vida **PATROL** o un punto de anclaje **KITE**. Además, es necesario comprobar que todas las herramientas y equipos estén en buenas condiciones de funcionamiento y que en la zona de instalación no haya obstáculos.
- Los módulos de 9 m pueden ser manipulados por un solo operario. Los módulos de 12 m requieren un operario más para garantizar un correcto abatimiento.

CÓDIGOS Y DIMENSIONES

LARGUEROS

CÓDIGO	d [mm]	L [mm]	
BORBAR45	45	3000	
BORBAR32	32	3000	
BORBAR45F	45	3000	
BORBAR32F	32	3000	
BORBAR45R	45	3000	
BORBARENDF	45	417	

EN AW
6063-T6

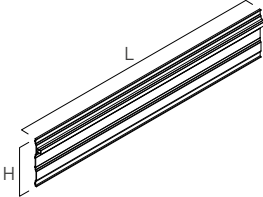
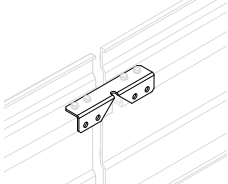
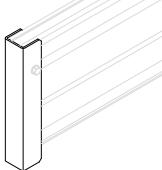
MONTANTES

CÓDIGO	H [mm]	
BORUP530WH	535	
BORUP760WH	765	
BORUP100	1005	
BORUP110	1105	
BORUP118	1185	
BORUP130	1305	
BORUP100F	1005	
BORUP110F BORUP110FR	1105	
BORUP113C	1120	
BORUP100R	1005	
BORUP110R	1105	
BORUP107US	1075	

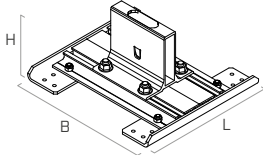
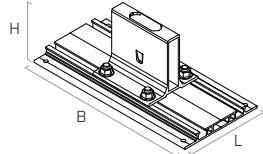
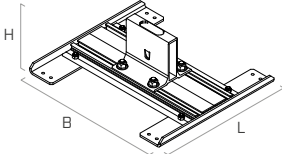
EN AW
6005A-T6

CÓDIGOS Y DIMENSIONES

RODAPIÉ

CÓDIGO		H [mm]	L [mm]	
BORTB	EN AW 6063-T6	150	3000	
BORTBJUN	EN AW 6063 H111	-	-	
BORTBCAP	EN AW 6063 H111	-	-	

BASES

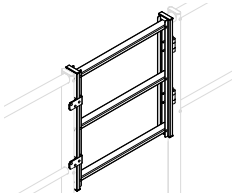
CÓDIGO	B [mm]	H [mm]	L [mm]	
BORBASEM250	305	138,5	280	
BORBASEM333PA	365	133,5	175	
BORBASEM333PE	420	138,5	365	

FIJACIÓN

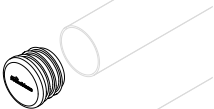
CÓDIGO		d [mm]	H [mm]	
MMS5525A2	1.4301 AISI304 INOX	5,5	25	
RIV6320		6,3	20,2	

CÓDIGOS Y DIMENSIONES

CANCELA DE SEGURIDAD

CÓDIGO		L [mm]	H [mm]	
BORGATE600	EN AW 5083 H111	600	640	

ACCESORIOS

CÓDIGO			
BORCAP45			
BORCAP32	LOPE		
BORCAP			
BORCOR	PP RECYCLED		
BORWALL	PP RECYCLED 1.4301 AISI304 INOX		
EPDM253	EPDM		

CONSIGNES DE SÉCURITÉ, MODE D'EMPLOI ET INSTALLATION

INTRODUCTION

DÉFINITION

Le garde-corps **BORDER M** est un système de protection collective anti-chute, idéal pour la sécurité des toits, réalisé en alliage d'aluminium (**EN AW 6005A-T6 e EN AW 6063-T6**) et pouvant être installé sur des toitures présentant une pente allant jusqu'à 10°.

NORMES

Le garde-corps à fixation horizontal **BORDER M** est conforme aux normes suivantes :

- **EN 14122-3:2016**
- **EN 13374:2025 CL.A (sauf le point 9)**
- **EN 13374:2013+A1:2018 CL.A (sauf le point 9)**
- **NF E85-015:2019 (France)**
- **DGUV 201-056 (Allemagne)**
- **OSHA 1910.29 (USA)**

Le tableau ci-dessous résume les principaux paramètres géométriques prévus par chaque réglementation :

	EN 14122-3: 2016	EN 13374: 2025 EN 13374: 2013 + A1: 2018 C.L.A	NF E85-015: 2019	OSHA 1910.29
Hauteur min. par rapport au niveau du sol	1,1 m	1 m	1 - 1,1 m	0,99 - 1,14 m (39 - 45 in)
Entraxe max. entre les sous-lisses	500 mm	470 mm	500 mm	480 mm
Entraxe max. entre les montants	1,5 m (conseillé)	-	1,5 m (conseillé)	-
Hauteur min. plinthe garde-pieds	10 cm	15 cm	10 cm	-

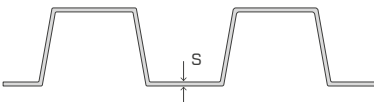
UTILISATION - ENTRETIEN

- Avant l'utilisation, contrôler visuellement que le garde-corps **BORDER** ne présente pas d'anomalie (impacts, déformations, etc.).
- Le garde-corps **BORDER** ne nécessite pas d'entretien particulier ; toutefois, un contrôle visuel doit être effectué au moins une fois par an par un technicien qualifié.
- Si le garde-corps **BORDER** est mal installé, endommagé ou s'il a permis d'arrêter une chute, son utilisation doit être immédiatement interrompue. Il ne doit pas être réutilisé tant qu'un opérateur qualifié n'a pas donné son autorisation écrite, à l'issue d'une inspection et d'une vérification.
- Si le produit est revendu hors du pays de destination, il est essentiel que le revendeur fournisse le manuel d'instruction dans la langue du pays d'utilisation du produit. Ces documents pourront être fournis sur demande en contactant le fabricant.
- Le garde-corps **BORDER** est un dispositif de protection collective permanent qui doit être utilisé par des professionnels sur les toitures non accessibles au public.
- Si le garde-corps **BORDER** est installé dans un milieu industriel pollué, pétrochimique, naval, ou en bord de mer, il devra nécessairement être soumis à un traitement de surface approprié comme le revêtement par poudre, l'anodisation, etc.
- Si nécessaire, il est conseillé de relier le garde-corps à un système de protection parafoudre selon les réglementations locales. Ne pas utiliser comme ligne de mise à la terre du parafoudre.
- Si une planimétrie a été fournie, il faut se référer à ce document lors de l'installation.

STOCKAGE

Les composants en aluminium brut sont conditionnés en contact les uns avec les autres. L'action de la pluie sur l'emballage fermé favorisera l'oxydation de ces composants. Dans ce cas, des taches superficielles peuvent apparaître. Celles-ci ne compromettent pas la qualité de l'aluminium mais peuvent nuire à l'aspect esthétique du garde-corps. Il est conseillé de débarrasser les colis et de conserver les composants séparés les uns des autres (aucun contact entre eux), ou de conserver les colis encore emballés dans un endroit sec.

SOUS-STRUCTURES ET FIXATIONS

EXIGENCE MINIMALE	MATÉRIAU	S _{min}
	ACIER	0,4 mm
	ALUMINIUM	0,7 mm

PRINCIPALES FORCES AGISSANT SUR LES RIVETS

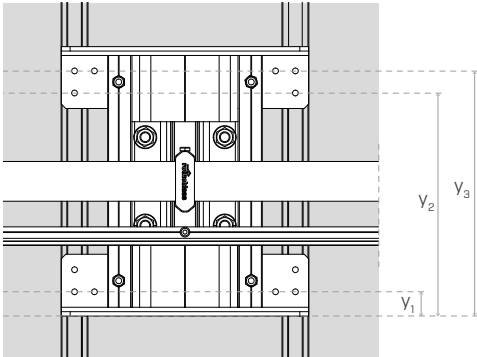
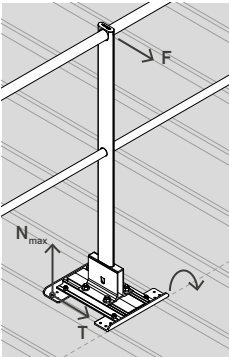
Les forces agissant sur le rivet (traction et cisaillement) sont déterminées en partant des hypothèses suivantes :

- bride rigide et répartition linéaire des efforts
- bras de levier égal à la longueur du montant (cas le plus défavorable : H = 110 cm)
- point de rotation pour la décomposition du moment correspondant au bord de la bride.
- entraxe maximal et force ponctuelle maximale au point le plus haut du montant, conformément à la réglementation en vigueur.

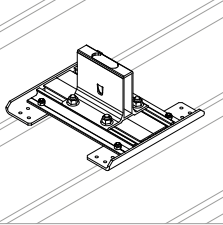
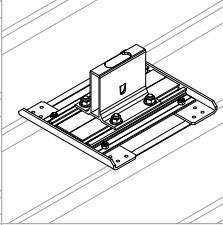
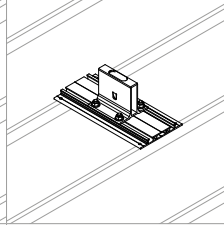
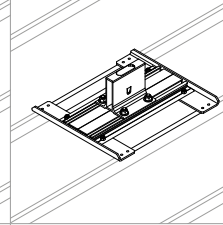
Les valeurs indiquées ci-dessous se rapportent à la contrainte du j-ième rivet de la rangée la plus sollicitée par rapport à l'axe de rotation.

$$T = \frac{F}{N_{riv}}$$

$$N = \frac{M_f}{\sum_{j=1}^m n_j \cdot y_j^2} \cdot y_j$$



La rangée la plus sollicitée est celle relative à l'axe y₃.

		BORBASEM250	BORBASEM250	BORBASEM333PA	BORBASEM333PE
					
T [N]	EN 14122-3: 2016 DGUV 201-056*	131,3	131,3	131,3	116,4
N _{max} [N]		515,2	515,2	398,2	371,4
T [N]	EN 13374: 2025 DGUV 201-056*	91,7	91,7	91,7	91,7
N _{max} [N]		359,8	359,8	278,1	292,5
T [N]	NF E85-015: 2019	154,7	154,7	154,7	137,2
N _{max} [N]		607,2	607,2	469,3	437,7
T [N]	OSHA 1910,29	148,3	148,3	148,3	148,3
N _{max} [N]		582,3	582,3	450,0	473,3

* DGUV 201-056 : disponible en configuration de garde-corps permanent (EN 14122) et de garde-corps temporaire (EN 13374).

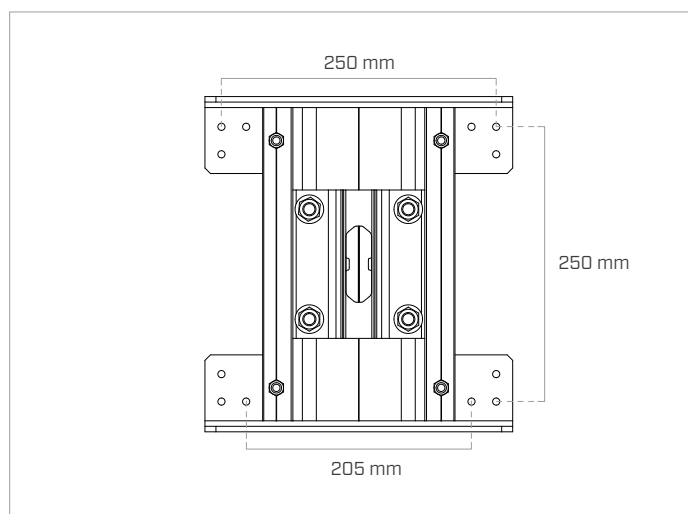
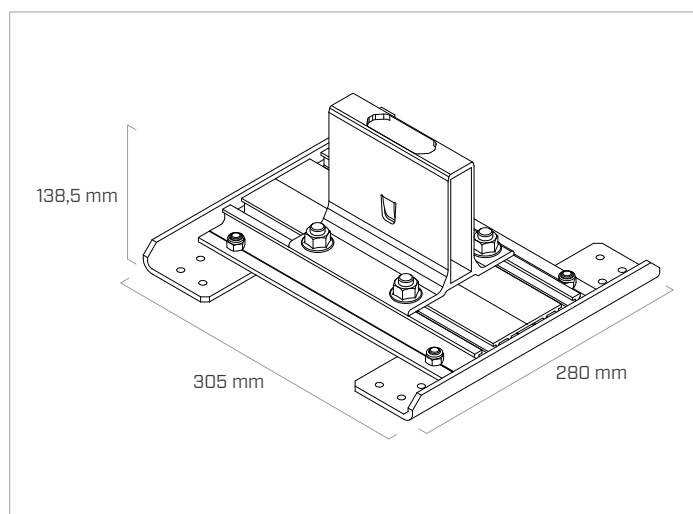
ÉQUIPEMENT



I TYPES DE BASES

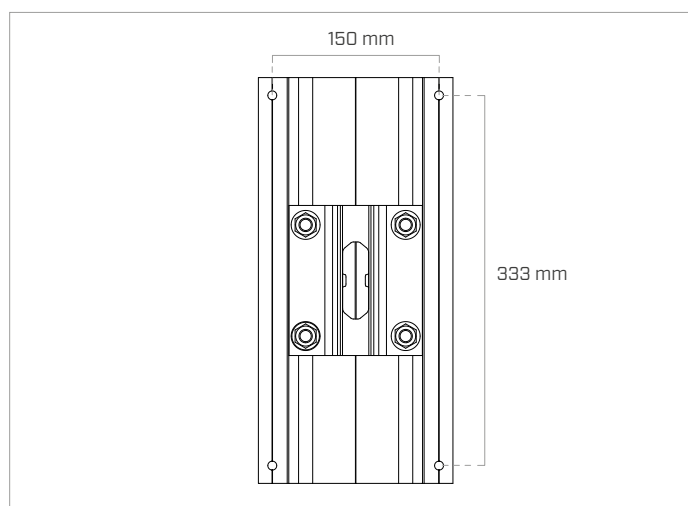
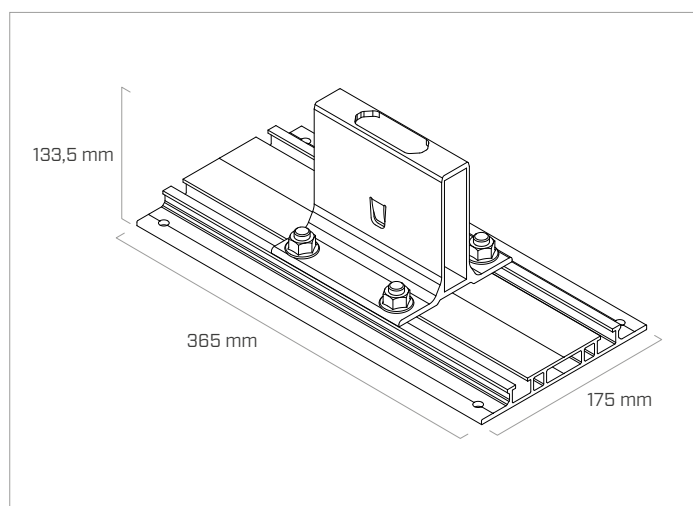
BORBASEM250

Base universelle sur tôle trapézoïdale, dans le sens parallèle et perpendiculaire aux nervures. Adaptable à un entraxe des nervures de 250 mm.



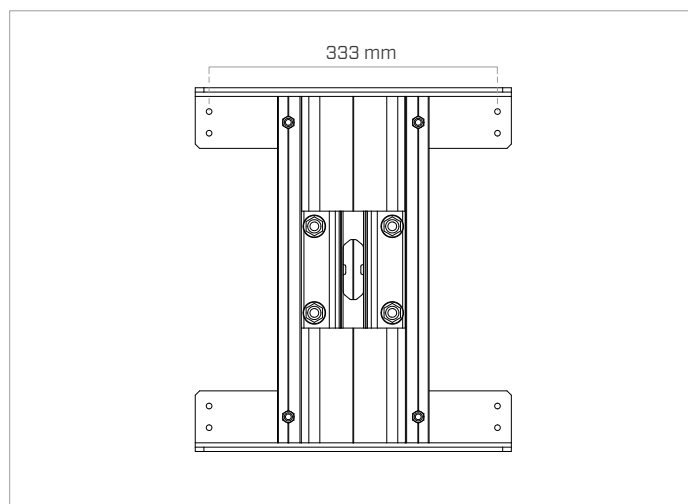
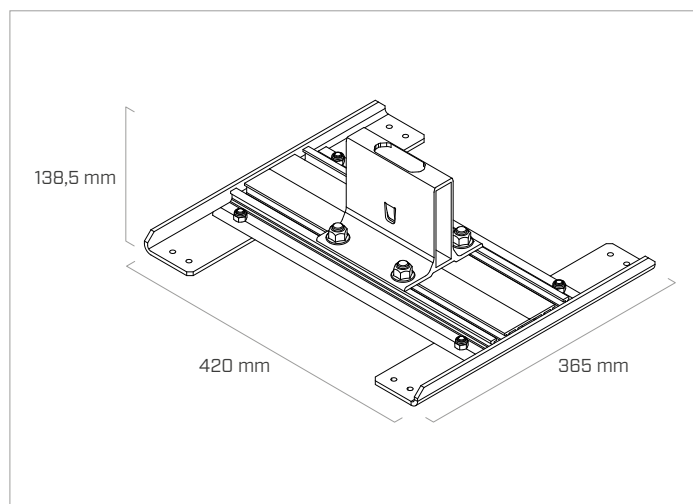
BORBASEM333PA

Base en tôle trapézoïdale, parallèle aux nervures. Adaptable à un entraxe des nervures de 333 mm.



BORBASEM333PE

Base en tôle trapézoïdale, perpendiculaire aux nervures. Adaptable à un entraxe des nervures de 333 mm.



FIXATION ET INSTALLATION DES BASES

Le garde-corps sur tôles nervurées est fixé à l'aide de rivets RIV6320 (Ø 6,3 x 20 mm – ATE-25/1169), avec des rondelles d'étanchéité intégrées et du ruban mono-adhésif EPDM253 (25 x 3 mm, rouleau de 20 m) afin de garantir l'étanchéité de l'ensemble de fixation à la sous-structure métallique.



OUTIL POUR LA FIXATION :
PINCE À RIVETER À BATTERIE

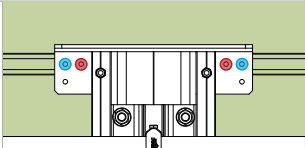
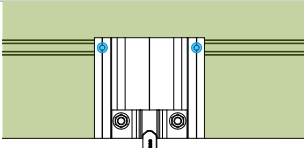
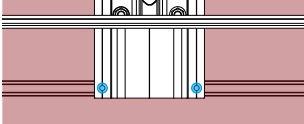
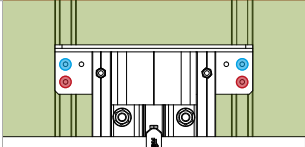
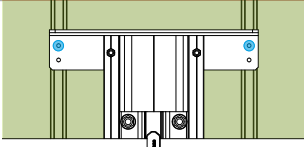
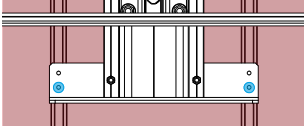
AVANT LA FIXATION	APRÈS LA FIXATION
Rivet RIV6320	

INDICATIONS D'INSTALLATION

Tableau 1

montant	types de montant	H _{montants}
BORUP100/R	droit et courbé	100 cm
BORUP110/R		110 cm
BORUP113C		110 cm
BORUP100F	rabattable	100 cm
BORUP110F/R		110 cm
BORUP107US	droit	107 cm

POSITION DES RIVETS SUR LA PLAQUE

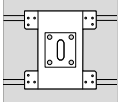
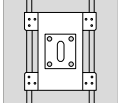
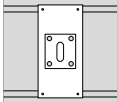
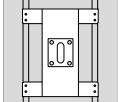
CONFIGURATION		SOUS-STRUCTURE N° RIVETS	CONFIGURATION		SOUS-STRUCTURE N° RIVETS
nervure 250 mm parallèle		ACIER 4 ●	nervure 333 mm parallèle		ACIER / ALUMINIUM 4 ●
		ALUMINIUM 4 ● + 2 ●			
nervure 250 mm perpendiculaire		ACIER 4 ●	nervure 333 mm perpendiculaire		ACIER / ALUMINIUM 4 ●
		ALUMINIUM 4 ● + 2 ●			

Zone interne

Zone externe

TABLEAU DES ENTREAXES ADMISSIBLES [Tableau 1 - Entraxes]

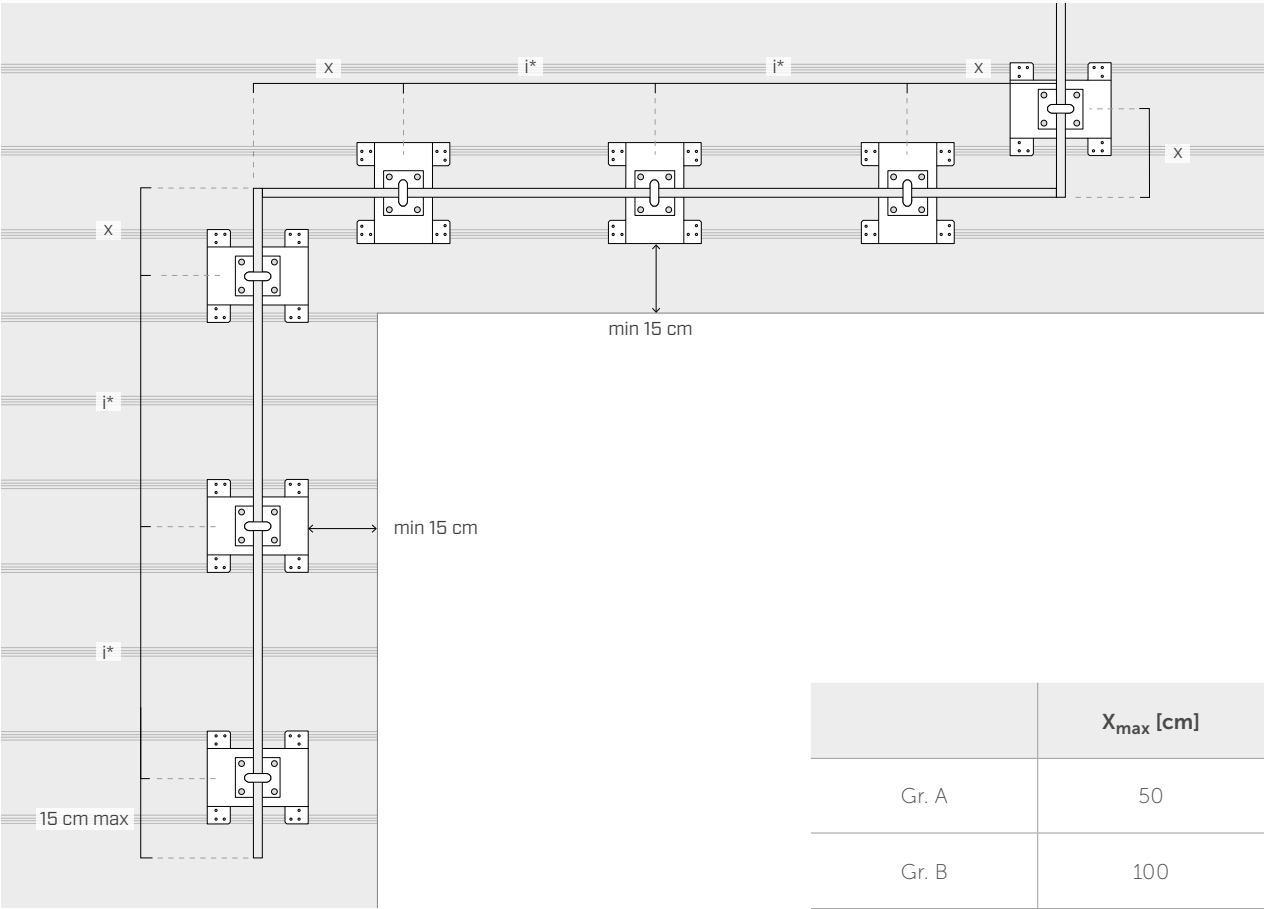
Ci-dessous figurent les entraxes maximaux d'installation du garde-corps **BORDER M**.
Pour la fixation, il convient d'utiliser exclusivement les rivets fournis dans le KITRIV (Ø 6,3 mm).

			Gr. A	Gr. B
TYPOLOGIE			EN 14122-3: 2016 NF E 85-015: 2019 DGUV 201-056* OSHA 1810,29	EN 13374 cl. A DGUV 201-056*
BORDER M	nervure 250 mm parallèle		150	250
	nervure 250 mm perpendiculaire		150	250
	nervure 333 mm parallèle		150	250
	nervure 333 mm perpendiculaire		133	233

* DGUV 201-056 : disponible en configuration de garde-corps permanent (EN 14122) et de garde-corps temporaire (EN 13374).

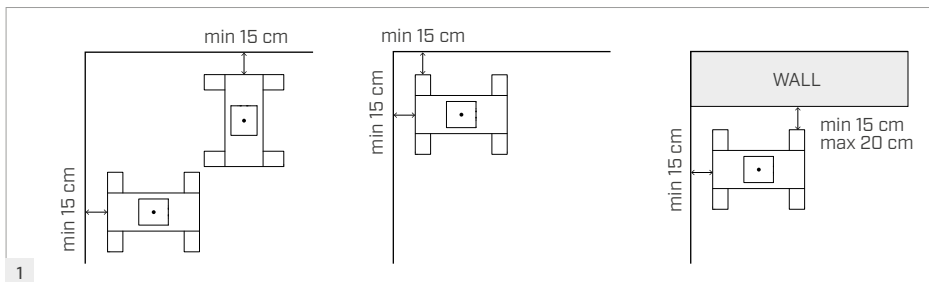
SCHÉMA DE MONTAGE DU GARDE-CORPS

Pour toutes les configurations du garde-corps **BORDER M**, il est nécessaire de respecter les critères d'installation suivants :

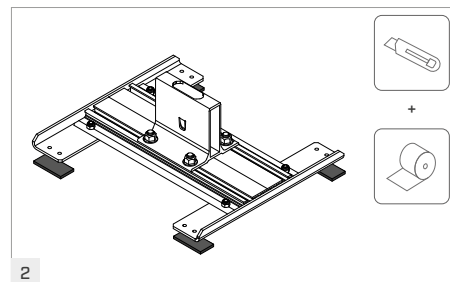


* i : entraxes de référence selon le Tableau 1 – Entraxes (p. 9)

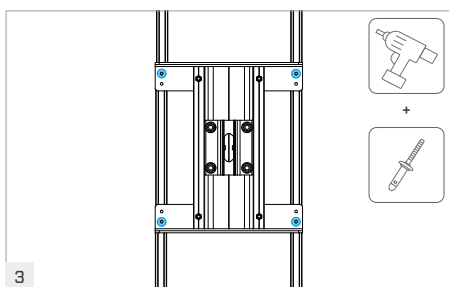
INSTALLATION DU GARDE-CORPS



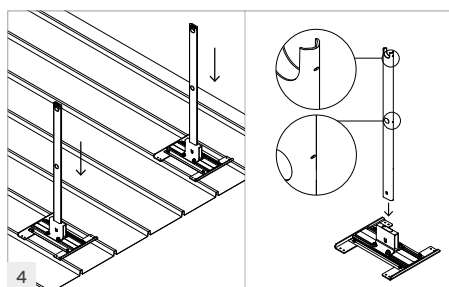
L'installation du garde-corps **BORDER M** nécessite la présence d'au moins deux opérateurs qualifiés. Pour un résultat optimal, il est conseillé de commencer par un angle.



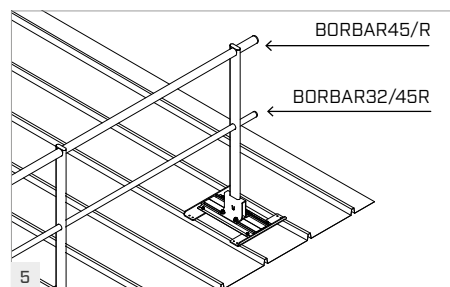
Utiliser le ruban mono-adhésif **EPDM253**, en découpant la quantité nécessaire pour imperméabiliser la surface située sous la plaque du **BORDER M**. Appliquer le ruban en veillant à ce que l'orifice de raccordement de la plaque soit entièrement recouvert par l'**EPDM**.



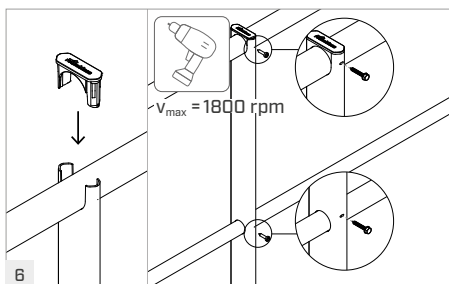
Disposer les plaques **M** conformément à la réglementation en vigueur, puis procéder à la fixation de la plaque **BORBASEM** à la sous-structure, en utilisant le nombre de fixations indiqué dans le tableau (tableau 1, p. 9).



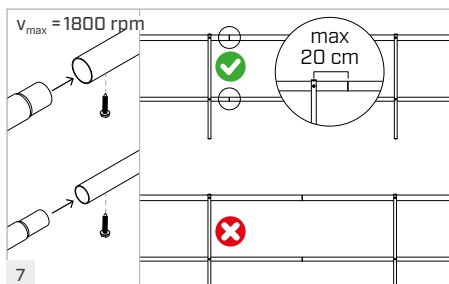
Insérer les montants dans les plaques **BORBASEM** en orientant les marques vers l'opérateur. Vérifier que les ailettes et les fenêtres s'encastrent correctement. Aucune vis de fixation n'est nécessaire. Le système base-montant se retire en poussant la base vers le haut. Si des vis sont présentes, il faut les retirer et percer un trou de Ø6 mm de diamètre à l'emplacement du trou conique.



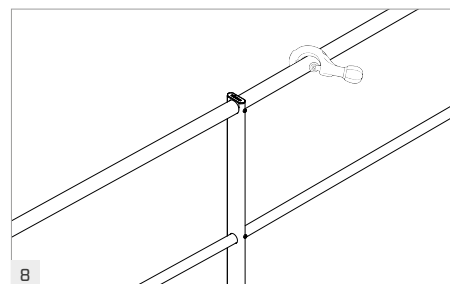
Insérer la sous-lisse intermédiaire **BORBAR32** puis la sous-lisse supérieure **BORBAR45**. Conformément à la norme **EN 13374**, il est nécessaire d'installer des sous-lisses renforcées **BORBAR45R**.



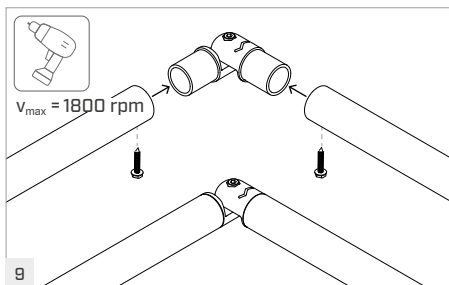
Insérer le capuchon **BORCAP** au sommet du montant. Fixer les sous-lisses aux montants avec des vis **MMS5525A2** au niveau des deux marques latérales.



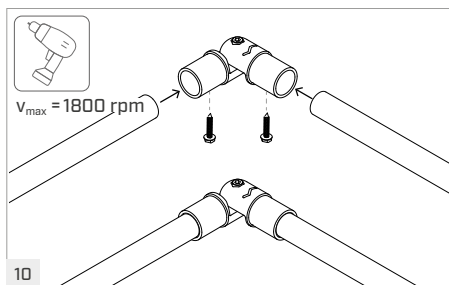
Raccorder les extrémités mâle/femelle de la lisse et sous-lisses, en les fixant avec des vis **MMS5525A2**. Conformément à la norme **EN 14122**, la sous-lisse doit s'arrêter à moins de 20 cm du montant le plus proche. Placer les vis sous les sous-lisses.



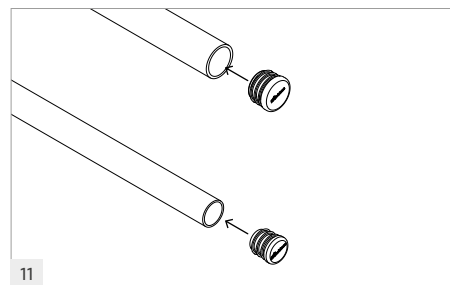
Adapter la dernière section du garde-corps en coupant la partie excédentaire des sous-lisses selon les indications du schéma à la page 10.



Insérer l'articulation angulaire **BORCOR** dans la sous-lisse et fixer avec des vis autotaraudeuses **MMS5525A2**.



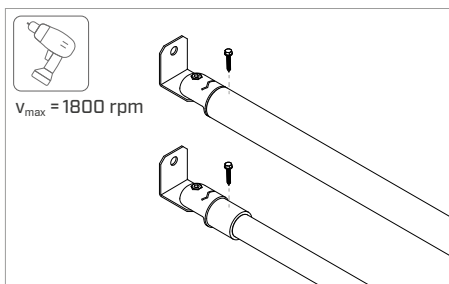
Insérer l'articulation angulaire **BORCOR** à l'extérieur de sous-lisse intermédiaire et fixer avec des vis autotaraudeuses **MMS5525A2**.



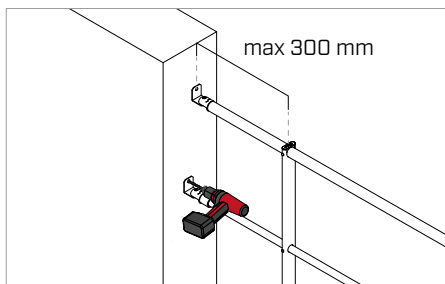
Insérer les capuchons **BORCAP45** et **BORCAP32** respectivement dans les lisses ou sous-lisses intermédiaires.

INSTALLATION

BORWALL

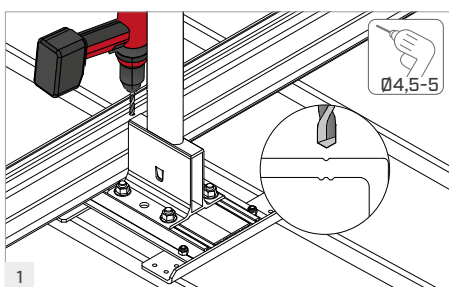


Insérer la lisse et la sous-lisse intermédiaire dans l'élément terminal mural **BORWALL** et fixer avec une vis autotaraudeuse **MMS5525A2**.

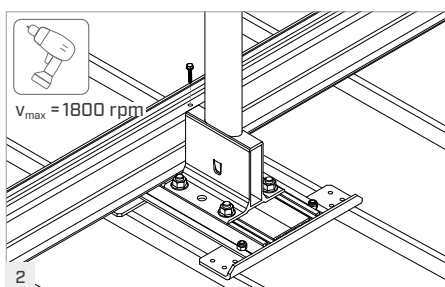


Respecter la distance maximale de **300 mm** par rapport au mur. Percer le mur avec une mèche de Ø10 mm et fixer l'élément terminal avec une cheville M10 (AB110115) ou sur du bois avec VGS Ø9 (VGS9100 + HUS8).

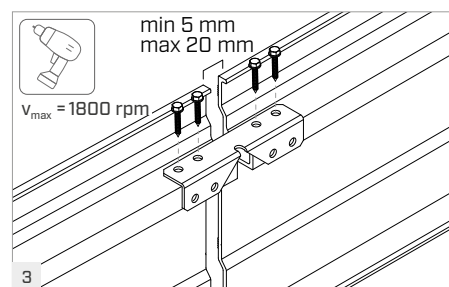
BORTB



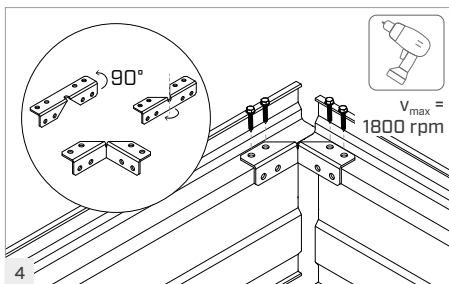
Positionner **BORTB** avec le support contre l'épaule de la base **BORBASEM**. Exécuter un pré-perçage traversant Ø 5 mm. Utiliser la rainure du support comme guide pour la pointe du tournevis.



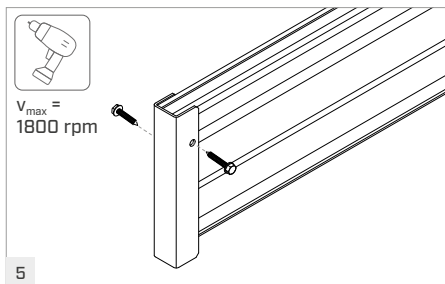
Une fois le pré-perçage réalisé, la plinthe garde-pieds peut être fixée à la base à l'aide d'une vis **MMS5525A2**.



Unir les extrémités de **BORTB** avec le connecteur **BORTBJUN**. Fixer avec les 4 vis **MM-S5525A2**, en laissant au moins 5 mm entre les plinthes pour éviter toute déformation thermique.



Dans les angles, tourner et plier manuellement le connecteur **BORTBJUN** jusqu'à obtenir l'angle souhaité. Fixer avec 4 vis autotaraudeuses **MMS5525A2**.



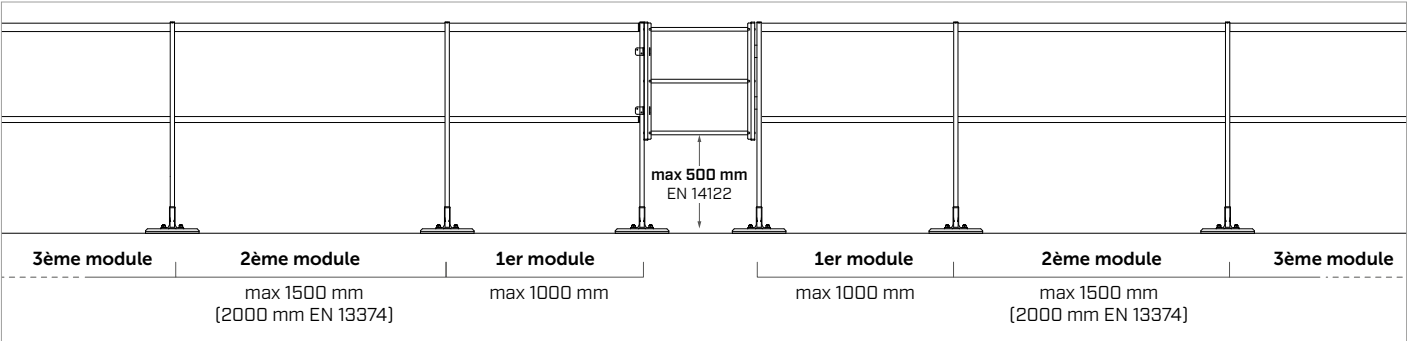
Fixer les capuchons de la plinthe garde-pieds avec 2 vis autotaraudeuses **MMS5525A2**.

INSTALLATION DU PORTILLON
BORGATE600

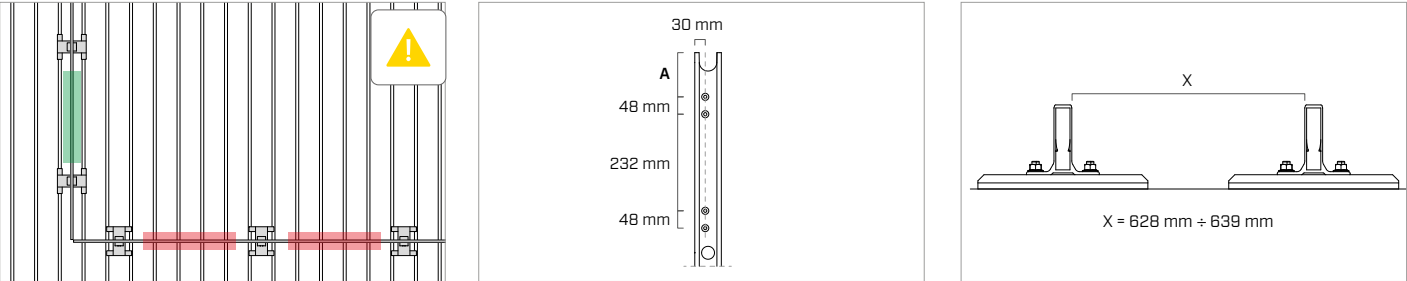
Table with 4 columns: EN 13374: 2025 Cl.A, EN 13374: 2013 +A1: 2018 Cl.A, EN 13374: 2025 Cl.A, DGVV 201-056

L'installation du portillon BORGATE600 doit être effectuée dans le respect des exigences minimales de stabilité du système.. Il est donc nécessaire d'installer au moins trois montants de chaque côté, en respectant cette répartition maximale des entraxes :

- 1er modulo: 1000 mm max
2ème modulo: 1500 mm max (pour EN 14122 3) - 2000 mm max (pour EN 13374)
3ème modulo : conformément aux informations figurant dans le Tableau 1 – Entraxes

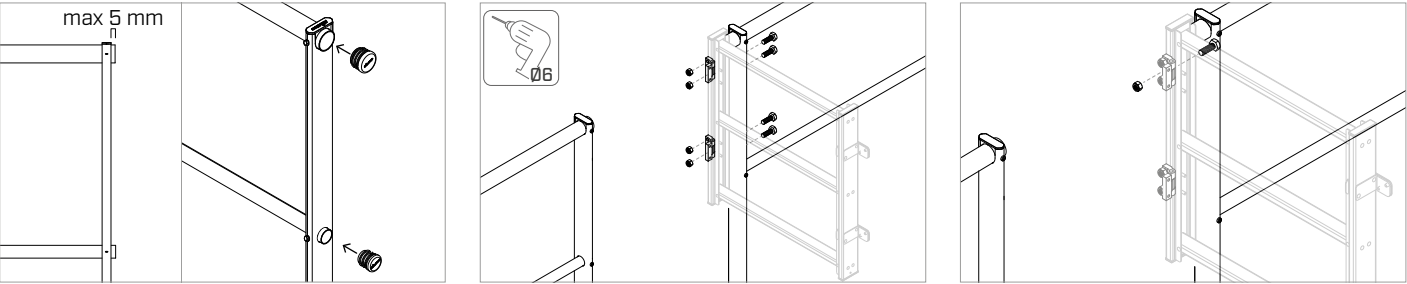


Le bord inférieur du portillon doit se trouver à une distance inférieure à 500 mm du plan de marche, conformément à la norme EN 14122-3. Vérifier la distance maximale autorisée par la réglementation applicable (par exemple, EN 13374 : espace maximal de 470 mm).



L'installation du portillon sur des garde-corps fixés à une tôle nervurée ou à un panneau sandwich n'est autorisée que lorsque le système est posé parallèlement au sens des nervures. Lorsque le garde-corps est installé perpendiculairement aux nervures, il n'est pas possible de monter le portillon.
Reporter sur le montant les mesures indiquées sur le dessin(1) et réaliser :
• 4 trous Ø 6,5 mm côté portillon ;
• 4 trous Ø 18 mm (min.) côté extérieur.
(1) La valeur A est définie en fonction des hauteurs de projet requises (voir le tableau ci-dessous).

Table with 6 columns: H montant [cm], Valeur A [mm] (EN 14122-3: 2016, DGVV 201-056), Valeur A [mm] (EN 13374: 2025 Cl.A, EN 13374: 2013 +A1: 2018 Cl.A, DGVV 201-056), NF E85-015: 2019, OSHA 1910.29. Rows show configurations for 250 mm and 333 mm ribbed panels.



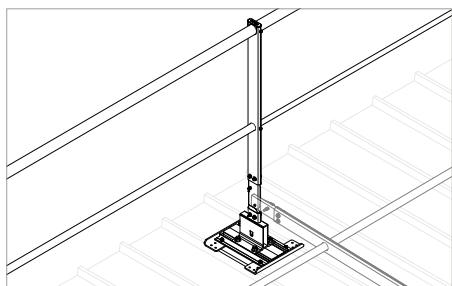
Positionner les sous-lisses de manière à ce qu'elles ne dépassent pas de plus de 5 mm du côté du montant. Si nécessaire, couper l'excédent. Installer ensuite le capuchon adapté au type de tube utilisé.
Monter le portillon en utilisant les vis M6 et les écrous autobloquants fournis dans l'emballage.
Pour limiter l'effet voile du portillon en cas de vent ou lorsqu'il n'est pas utilisé, il est possible d'installer une vis M10 supplémentaire (non fournie) afin de le bloquer en position fermé de manière permanente.

INSTALLATION DU GARDE-CORPS RABATTABLE

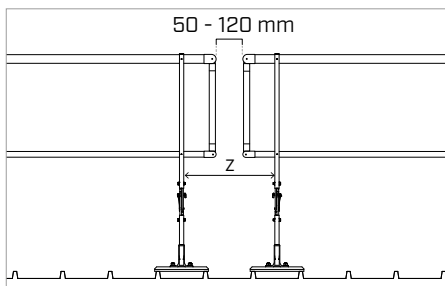
EN 13374:2025 CIA	EN 13374:2013 +A1:2018 CIA	EN 14122-3: 2016	NF E85-015: 2019
-------------------------	----------------------------------	------------------------	------------------------

BORUP100F - BORUP110F

Pour l'installation des garde-corps rabattables, la procédure décrite ci-dessus reste valable. Il convient toutefois de respecter certaines consignes supplémentaires :



Les garde-corps rabattables pour **BORDER M** doivent être installés du côté de l'assemblage (et non pas du côté de la broche), de manière à ce que le montant se rabatte vers le côté du toit et jamais vers l'extérieur.

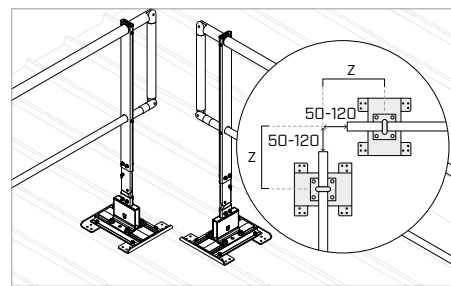


Les garde-corps rabattables pour **BORDER M** sont installés en modules de 9 m (7 montants reliés) ou de 12 m (9 montants reliés). Installer deux montants d'extrémité en respectant les distances maximales suivantes :

BORBASEM250: $z_{max} = 500$ mm

BORBASEM333PE/PA: $z_{max} = 666$ mm

Maintenir également une distance comprise entre 50 et 120 mm entre les sous-lisses d'extrémité verticales **BORBARENDF**.

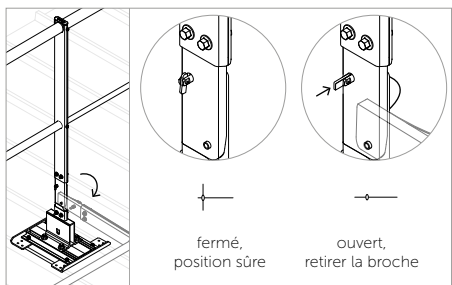


Installer deux montants d'extrémité en respectant les distances maximales suivantes :

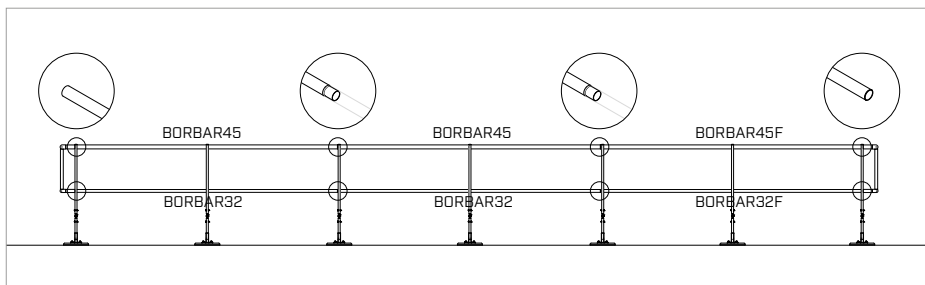
BORBASEM250: $z_{max} = 250$ mm

BORBASEM333PE/PA: $z_{max} = 350$ mm

Maintenir également une distance comprise entre 50 et 120 mm entre les sous-lisses d'extrémité verticales **BORBARENDF**.



Pour rabattre l'ensemble du garde-corps, retirer les broches de leurs logements respectifs.



Les sous-lisses principales à utiliser sont **BORBAR45** et **BORBAR32**, toutefois chaque module doit se terminer avec les sous-lisses spécifiques sans réduction **BORBAR45F** et **BORBAR32F**.

	EN 14122-3: 2016	DVGU 201-056	EN 13374:2025 CIA	EN 13374:2013 +A1:2018 CIA	DVGU 201-056	NF E85-015: 2019	OSHA 1910.29
Montant H = 110 cm		BORUP110F		BORUP110FR		BORUP110F	N/A
Sous-lisse supérieure		BORBAR45/F		BORBAR45R*		BORBAR45/F	N/A
Sous-lisse intermédiaire		BORBAR32/F		BORBAR45R*		BORBAR32/F	N/A
Montant H = 100 cm		N/A		N/A		BORUP100F	N/A
Sous-lisse supérieure		N/A		N/A		BORBAR45/F	N/A
Sous-lisse intermédiaire		N/A		N/A		BORBAR32/F	N/A

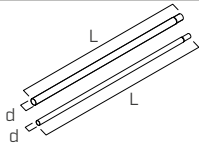
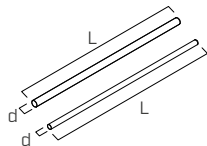
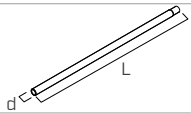
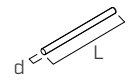
* Pour les sous-lisses d'extrémité utilisées conformément à la norme EN 13374, il est nécessaire de couper la partie présentant une réduction excessive.

AVERTISSEMENTS GÉNÉRAUX POUR L'UTILISATION

- Avant de basculer le garde-corps, vérifier que l'opérateur se trouve en conditions de sécurité. L'utilisateur doit être relié à un dispositif anti-chute, tel qu'une ligne de vie **PATROL** ou un point d'ancrage **KITE**. De plus, il est nécessaire de s'assurer que tous les outils et équipements soient en bon état de fonctionnement et que la zone d'installation soit parfaitement dégagée.
- Les modules de 9 m peuvent être manipulés par un seul opérateur. Les modules de 12 m nécessitent un opérateur supplémentaire pour être basculés correctement.

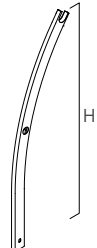
CODES ET DIMENSIONS

SOUS-LISSES

CODE	d [mm]	L [mm]	
BORBAR45	45	3000	
BORBAR32	32	3000	
BORBAR45F	45	3000	
BORBAR32F	32	3000	
BORBAR45R	45	3000	
BORBARENDF	45	417	

EN AW
6063-T6

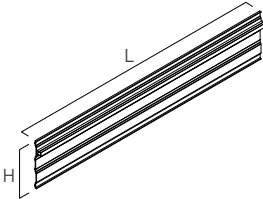
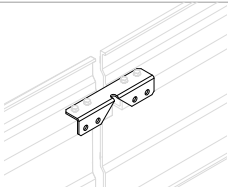
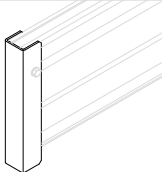
MONTANTS

CODE	H [mm]	
BORUP530WH	535	
BORUP760WH	765	
BORUP100	1005	
BORUP110	1105	
BORUP118	1185	
BORUP130	1305	
BORUP100F	1005	
BORUP110F BORUP110FR	1105	
BORUP113C	1120	
BORUP100R	1005	
BORUP110R	1105	
BORUP107US	1075	

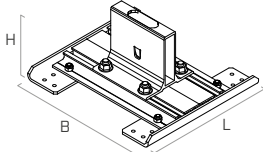
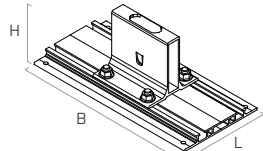
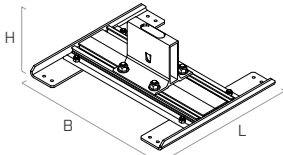
EN AW
6005A-T6

CODES ET DIMENSIONS

PLINTHE GARDE-PIEDS

CODE		H [mm]	L [mm]	
BORTB	EN AW 6063-T6	150	3000	
BORTBJUN	EN AW 6063 H111	-	-	
BORTBCAP	EN AW 6063 H111	-	-	

BASES

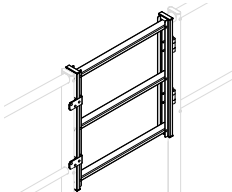
CODE	B [mm]	H [mm]	L [mm]	
BORBASEM250	305	138,5	280	
BORBASEM333PA	365	133,5	175	
BORBASEM333PE	420	138,5	365	

FIXATION

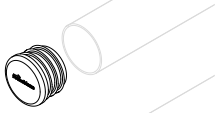
CODE		d [mm]	H [mm]	
MMS5525A2	1.4301 AISI304 INOX	5,5	25	
RIV6320		6,3	20,2	

CODES ET DIMENSIONS

PORTILLON DE SÉCURITÉ

CODE		L [mm]	H [mm]	
BORGATE600	EN AW 5083 H111	600	640	

ACCESSOIRES

CODE			
BORCAP45			
BORCAP32	LOPE		
BORCAP			
BORCOR	PP RECYCLED		
BORWALL	PP RECYCLED	1.4301 AISI304 INOX	
EPDM253	EPDM		

NORMAS DE SEGURANÇA, INSTRUÇÕES DE UTILIZAÇÃO E INSTALAÇÃO

INTRODUÇÃO

DEFINIÇÕES

O parapeito **BORDER M** é um sistema de proteção coletiva antiqueda, ideal para a segurança em coberturas, realizado em liga de alumínio (**EN AW 6005A-T6 e EN AW 6063-T6**), que pode ser instalado em coberturas com inclinação até 10°.

NORMAS

O parapeito de fixação horizontal **BORDER M** cumpre as seguintes normas:

- **EN 14122-3:2016**
- **EN 13374:2025 Cl.A (exceto ponto 9)**
- **EN 13374:2013+A1:2018 Cl.A (exceto ponto 9)**
- **NF E85-015:2019 (França)**
- **DGUV 201-056 (Alemanha)**
- **OSHA 1910.29 (EUA)**

A tabela que se segue resume os principais parâmetros geométricos previstos em cada norma:

	EN 14122-3: 2016	EN 13374: 2025 EN 13374: 2013 +A1: 2018 C.L.A	NF E85-015: 2019	OSHA 1910.29
Altura mín. da superfície de passagem	1,1 m	1 m	1 - 1,1 m	0,99 - 1,14 m (39 - 45 in)
Entre-eixo máx. entre as correntes	500 mm	470 mm	500 mm	480 mm
Entre-eixo máx. entre os montantes	1,5 m (recomendado)	-	1,5 m (recomendado)	-
Altura mín. do rodapé	10 cm	15 cm	10 cm	-

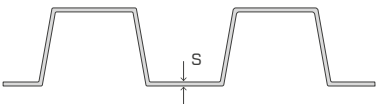
USO - MANUTENÇÃO

- Antes da utilização, certificar-se, através de uma inspeção visual, de que o parapeito **BORDER** não apresenta qualquer anomalia (impactos, deformações, etc.).
- O parapeito **BORDER** não requer manutenção específica, no entanto, é necessário que um operador qualificado efetue uma inspeção visual, pelo menos, uma vez por ano.
- Se o parapeito **BORDER** tiver sido instalado de forma incorreta, estiver danificado ou tiver sido utilizado para travar uma queda, a sua utilização deve ser imediatamente interrompida. Não deve ser reutilizado até que seja obtida a autorização por escrito de um operador qualificado, na sequência de uma inspeção e verificação.
- Se o produto for revendido fora do país de destino, é essencial que o revendedor forneça o manual de instruções na língua do país em que o produto é utilizado. Estes documentos podem ser fornecidos mediante pedido, contactando o fabricante.
- O parapeito **BORDER** é um dispositivo de proteção coletiva permanente, que deve ser utilizado exclusivamente por profissionais em coberturas não acessíveis ao público.
- Se for instalado em ambientes industriais poluídos, petroquímicos, navais ou costeiros, o parapeito **BORDER** deve ser submetido a um tratamento de superfície adequado, como pintura a pó, anodização, etc.
- Se necessário, recomenda-se ligar o parapeito a um sistema de proteção contra descargas atmosféricas, de acordo com a regulamentação local. Não utilizar como linha de ligação à terra do para-raios.
- Caso tenha sido fornecida uma planta, consultar esse documento durante a instalação.

ARMAZENAMENTO

Os componentes de alumínio em bruto são embalados em contacto uns com os outros. A ação da chuva sobre a embalagem fechada pode favorecer a oxidação destes componentes. Neste caso, podem surgir manchas superficiais. Estas manchas não comprometem a qualidade do alumínio, mas podem prejudicar o aspeto estético do parapeito. Recomenda-se desembalar a embalagem e manter os componentes separados uns dos outros (sem que entrem em contacto entre si), ou guardar as embalagens ainda fechadas num local seco.

SUBESTRUTURAS E FIXAÇÕES

REQUISITO MÍNIMO	MATERIAL	S _{min}
	AÇO	0,4 mm
	ALUMÍNIO	0,7 mm

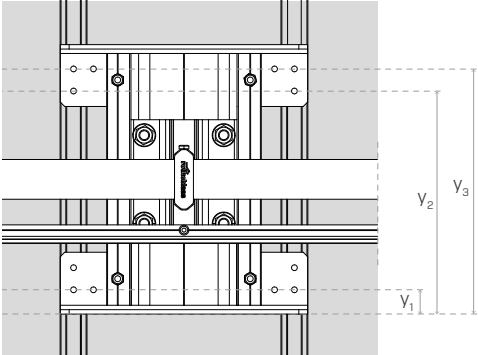
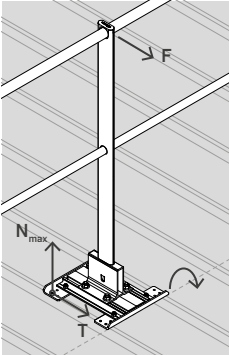
PRINCIPAIS FORÇAS QUE ATUAM NOS REBITES

As forças que atuam sobre o rebite (tração e corte) são determinadas partindo das seguintes hipóteses:

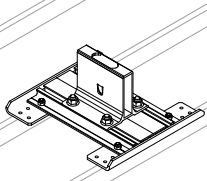
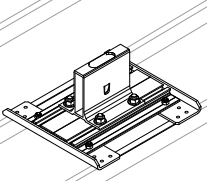
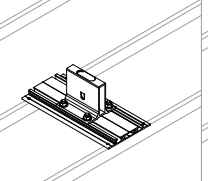
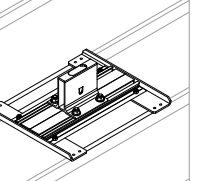
- flange rígida e distribuição linear das forças
- braço de ação igual ao comprimento do montante (caso mais desfavorável: H = 110 cm)
- ponto de rotação para a decomposição do momento correspondente à borda da flange
- entre-eixo máximo e força pontual máxima no topo do montante, de acordo com a regulamentação aplicável.

Os valores a seguir apresentados referem-se à tensão do j-ésimo rebite da fila mais tensionada em relação ao eixo de rotação.

$$T = \frac{F}{N_{riv}}$$
$$N = \frac{M_f}{\sum_{j=1}^m n_j \cdot y_j^2} \cdot y_j$$



A fila mais tensionada é aquela relativa ao eixo y₃.

		BORBASEM250	BORBASEM250	BORBASEM333PA	BORBASEM333PE
					
T [N]	EN 14122-3: 2016 DGUV 201-056*	131,3	131,3	131,3	116,4
N _{max} [N]		515,2	515,2	398,2	371,4
T [N]	EN 13374: 2025 DGUV 201-056*	91,7	91,7	91,7	91,7
N _{max} [N]		359,8	359,8	278,1	292,5
T [N]	NF E85-015: 2019	154,7	154,7	154,7	137,2
N _{max} [N]		607,2	607,2	469,3	437,7
T [N]	OSHA 1910.29	148,3	148,3	148,3	148,3
N _{max} [N]		582,3	582,3	450,0	473,3

* DGUV 201-056: disponível tanto na configuração de parapeito permanente (EN 14122) como de parapeito temporário (EN 13374).

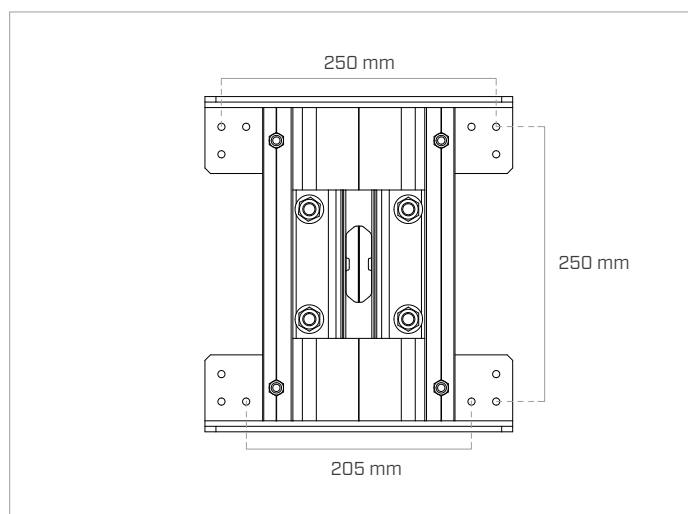
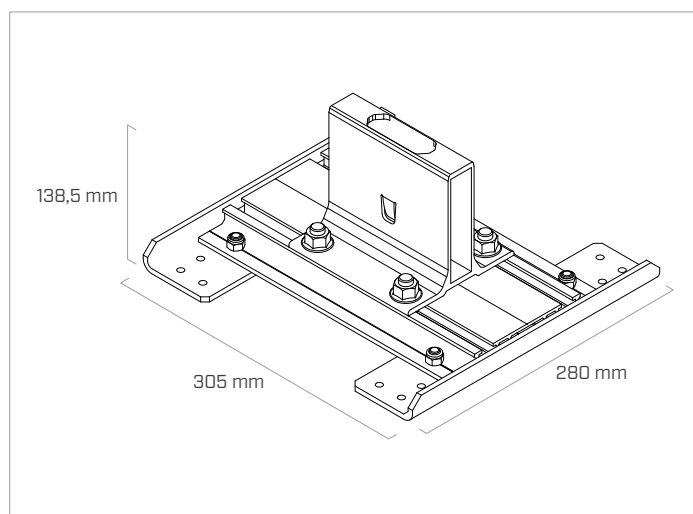
EQUIPAMENTO



TIPOLOGIA DE BASES

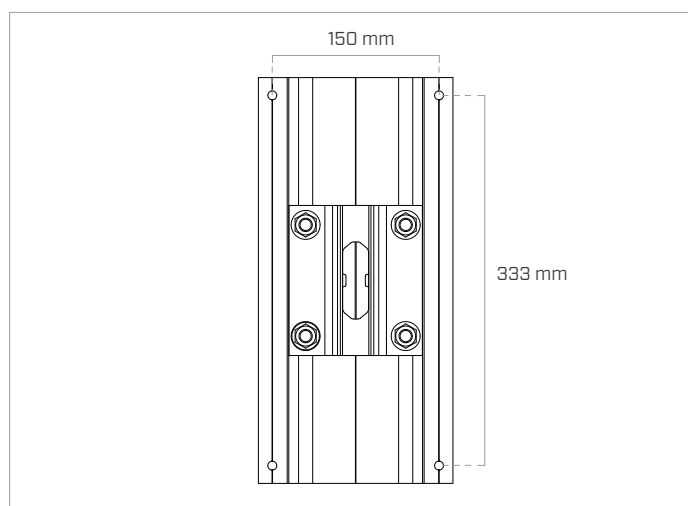
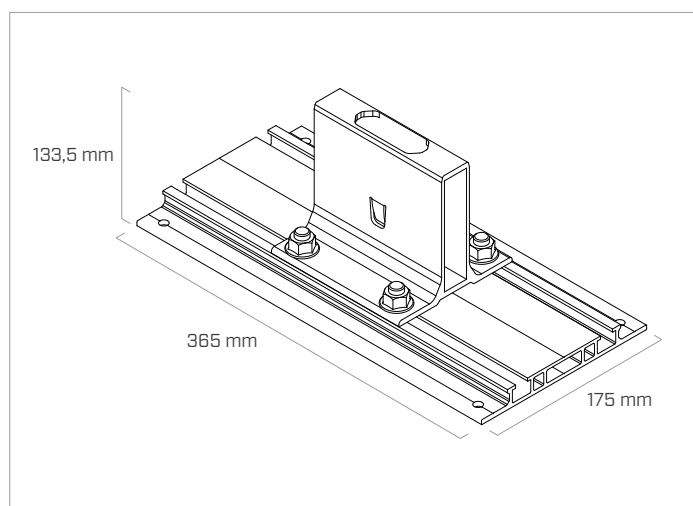
BORBASEM250

Base universal sobre chapa trapezoidal, na direção paralela e perpendicular às nervuras. Adaptável a entre-eixos das nervuras de 250 mm.



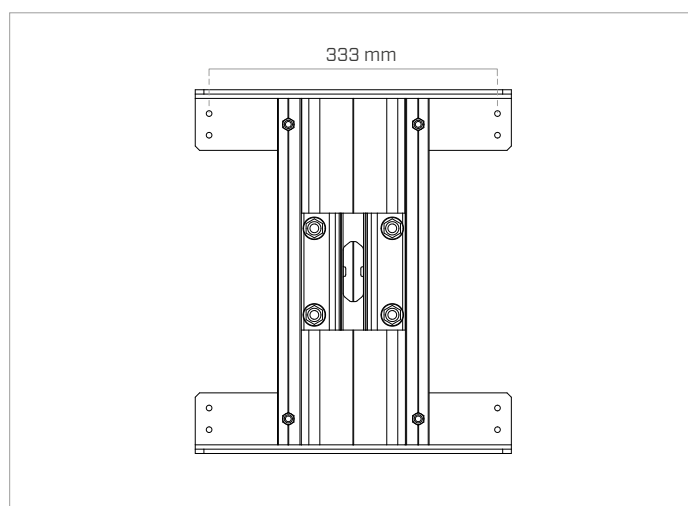
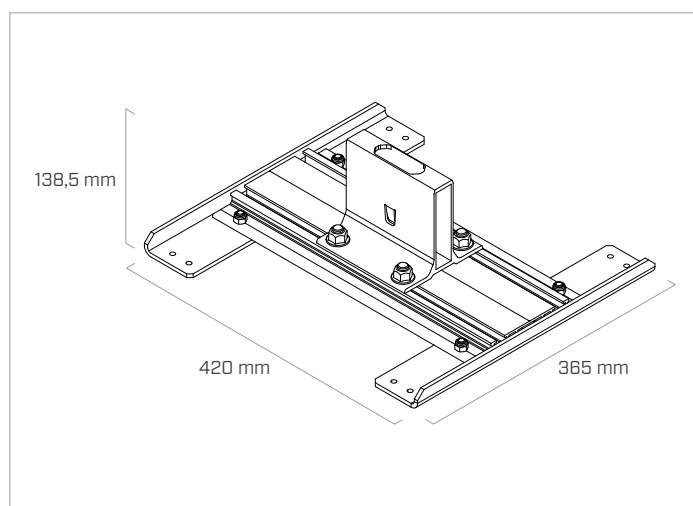
BORBASEM333PA

Base sobre chapa trapezoidal, na direção paralela às nervuras. Adaptável a entre-eixos das nervuras de 333 mm.



BORBASEM333PE

Base sobre chapa trapezoidal, na direção perpendicular às nervuras. Adaptável a entre-eixos das nervuras de 333 mm.



FIXAÇÃO E INSTALAÇÃO DAS BASES

O parapeito sobre chapas perfiladas é fixado através de rebites RIV6320 (Ø 6,3 x 20 mm – ETA-25/1169), com anilhas de vedação integradas e fita monoadesiva EPDM253 (25 x 3 mm, rolo de 20 m) para garantir a impermeabilização do grupo de fixação à subestrutura metálica.



FERRAMENTA DE FIXAÇÃO:
Rebitadora com bateria

ANTES DA FIXAÇÃO	APÓS A FIXAÇÃO
Rebite RIV6320	
Chapa de base M	
Fita monoadesiva EPDM253	
Chapa trapezoidal	

ESPECIFICAÇÕES DE INSTALAÇÃO

Tabela 1

montante	tipo de montante	H _{montantes}
BORUP100/R	reto e curvo	100 cm
BORUP110/R		110 cm
BORUP113C		110 cm
BORUP100F	rebatível	100 cm
BORUP110F/R		110 cm
BORUP107US	reto	107 cm

POSIÇÃO DOS REBITES NA CHAPA

CONFIGURAÇÃO		SUBESTRUTURA N.º DE REBITES	CONFIGURAÇÃO		SUBESTRUTURA N.º DE REBITES
nervura 250 mm paralela		AÇO 4	nervura 333 mm paralela		AÇO/ ALUMÍNIO 4
		ALUMÍNIO 4 + 2			
nervura 250 mm perpendicular		AÇO 4	nervura 333 mm perpendicular		AÇO/ ALUMÍNIO 4
		ALUMÍNIO 4 + 2			

Área interna
Área externa

TABELA ENTRE-EIXOS ADMISSÍVEIS [Tabela 1 - Entre-eixos]

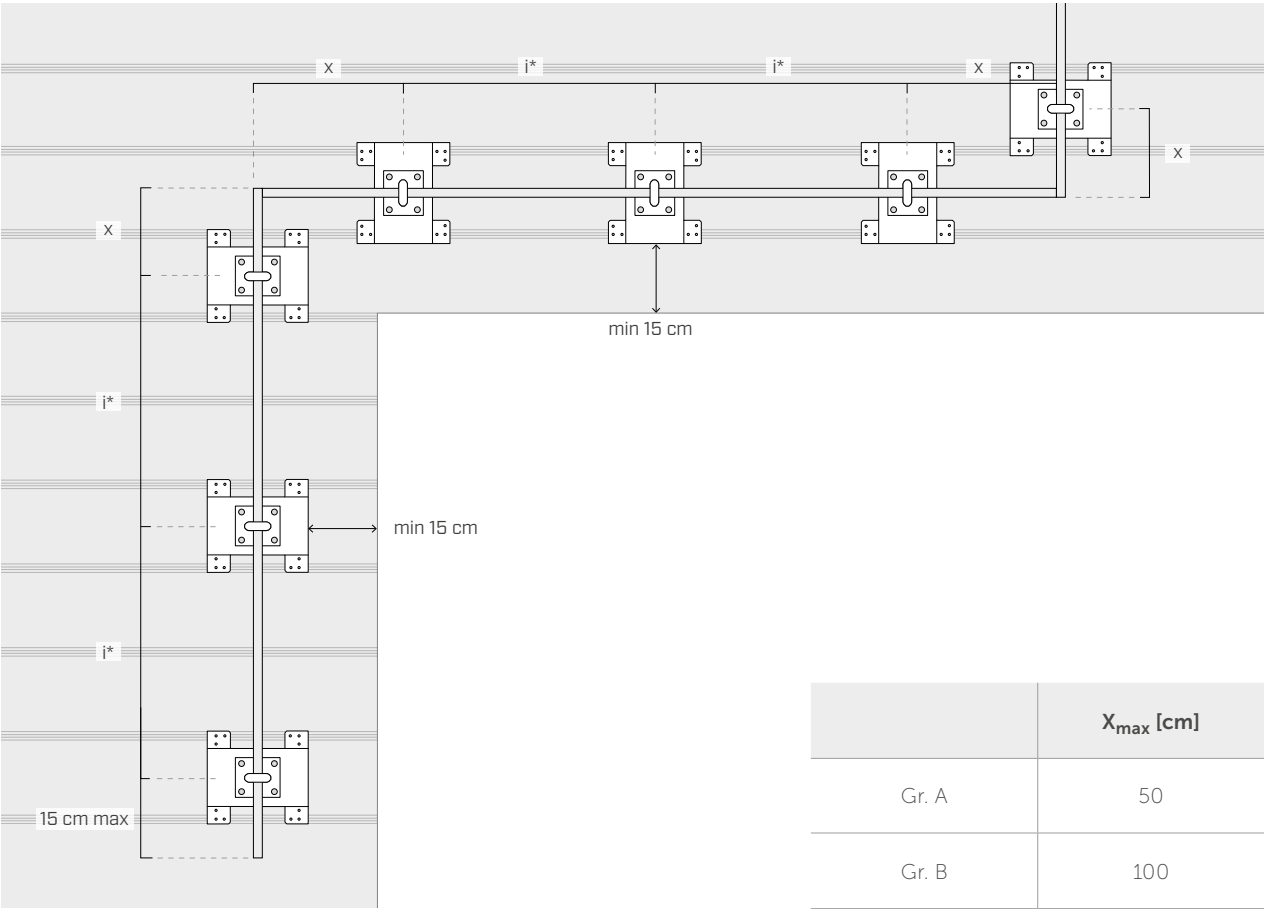
A seguir, são indicados os entre-eixos máximos para a instalação do parapeito **BORDER M**. Para a fixação, devem ser utilizados exclusivamente os rebites fornecidos no KITRIV (Ø 6,3 mm).

			Gr. A	Gr. B
TIPOLOGIA			EN 14122-3: 2016 NF E 85-015: 2019 DGVV 201-056* OSHA 1810.29	EN 13374 cl. A DGVV 201-056*
BORDER M	nervura 250 mm paralela		150	250
	nervura 250 mm perpendicular		150	250
	nervura 333 mm paralela		150	250
	nervura 333 mm perpendicular		133	233

* DGVV 201-056: disponível tanto na configuração de parapeito permanente (EN 14122) como de parapeito temporário (EN 13374).

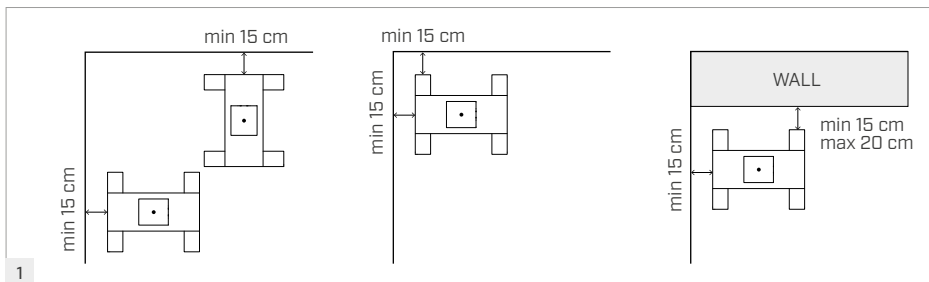
ESQUEMA DE MONTAGEM DO PARAPEITO

Em todas as configurações do parapeito **BORDER M**, é necessário respeitar os seguintes critérios de instalação:

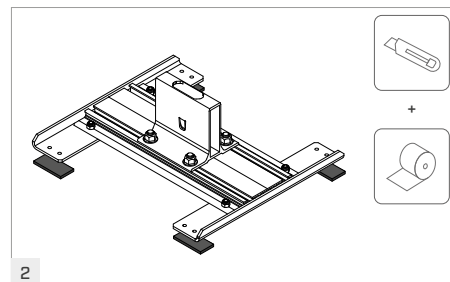


* i : entre-eixos de referência de acordo com a Tabela 1 - Entre-eixos (pág. 9)

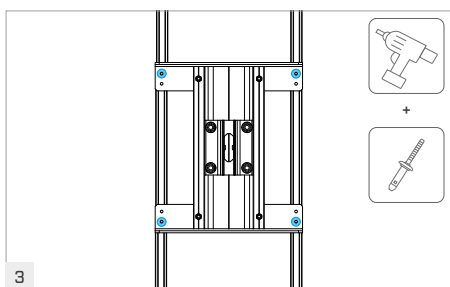
INSTALAÇÃO DO PARAPEITO



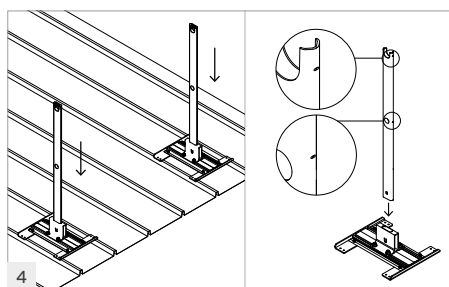
Para a instalação do parapeito **BORDER M**, é necessária a presença de, pelo menos, dois operadores qualificados. Para obter melhores resultados, é recomendável começar num canto.



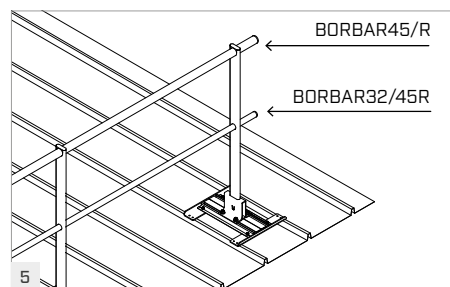
Utilizar a fita monoadesiva **EPDM253**, cortando a quantidade necessária para impermeabilizar a superfície subjacente à chapa do **BORDER M**. Aplicar a fita, certificando-se de que o orifício de ligação da chapa fica completamente coberto pelo **EPDM**.



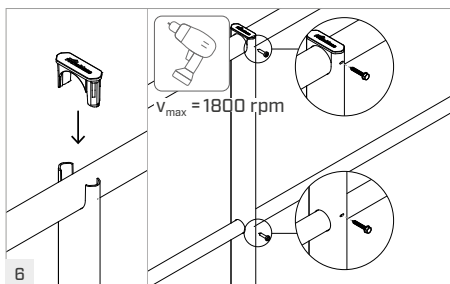
Colocar as chapas **M** de acordo com a regulamentação aplicável e, em seguida, fixar a chapa **BORBASEM** à subestrutura, utilizando o número de fixações indicado na tabela (tab.1, pág. 9).



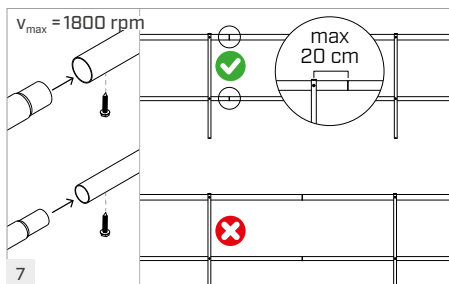
Inserir os montantes nas chapas **BORBASEM** com as marcas viradas para o operador. Verificar o encaixe correto entre as aletas e as janelas. Não são necessários parafusos para a fixação. Para remover o sistema base-montante, empurrar a base para cima. Se existirem parafusos, retirá-los e furar Ø6 mm no ponto do furo cônico.



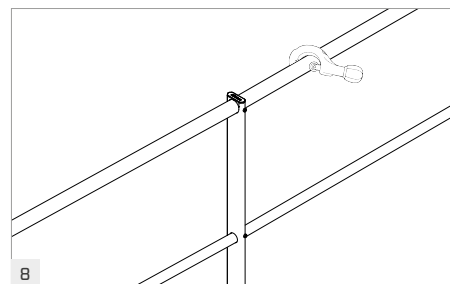
Inserir a corrente intermédia **BORBAR32** e, em seguida, a corrente superior **BORBAR45**. Em conformidade com a norma **EN 13374**, é necessário instalar as correntes reforçadas **BORBAR45R**.



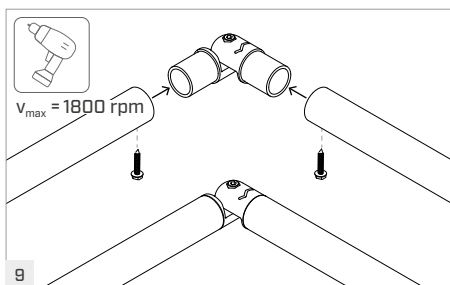
Inserir a tampa **BORCAP** no topo do montante. Fixar as correntes aos montantes com o parafuso **MMS5525A2** nas duas marcas laterais.



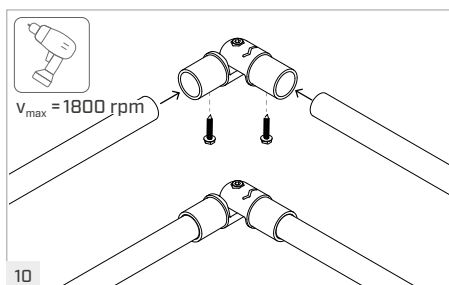
Ligar as extremidades macho/fêmea do corrimão e das correntes, fixando-as com parafusos **MMS5525A2**. De acordo com a **EN 14122**, o corrimão não deve terminar a mais de 20 cm do montante mais próximo. Colocar os parafusos sob as correntes.



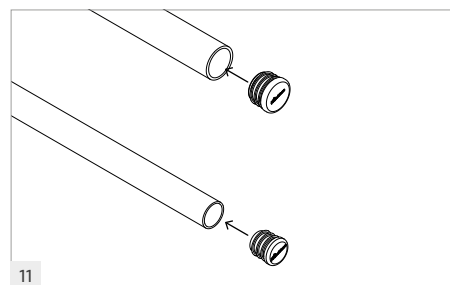
Adaptar a última secção do parapeito, cortando a parte excedente das correntes, de acordo com as indicações do esquema na pág. 10



Inserir a articulação angular **BORCOR** no corrimão e fixar com parafusos autorroscantes **MMS5525A2**.



Inserir a articulação angular **BORCOR** no exterior da corrente intermédia e fixar com os parafusos autorroscantes **MMS5525A2**.

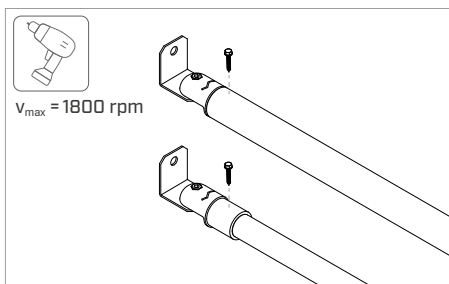


Inserir as tampas **BORCAP45** e **BORCAP32** nos corrimãos ou correntes intermédias.

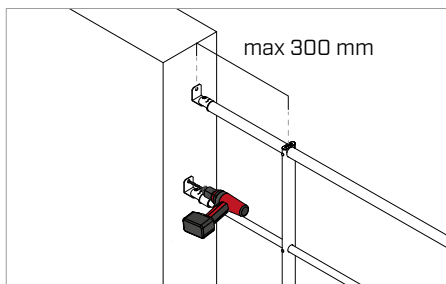
IT

INSTALAÇÃO

BORWALL

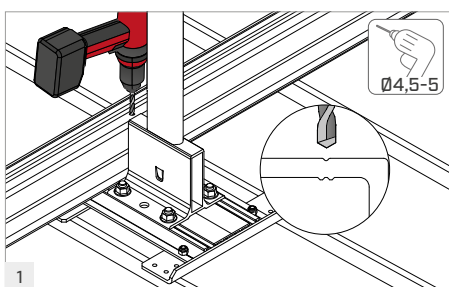


Inserir o corrimão e a corrente intermédia no elemento terminal de parede **BORWALL** e fixar com o parafuso autorroscante **MMS5525A2**.

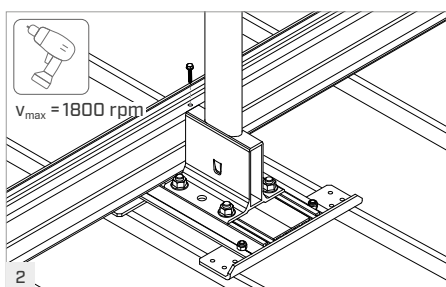


Respeitar a distância máxima de **300 mm** da parede. Furar a parede com a broca Ø10 mm e fixar o elemento terminal com uma bucha M10 (AB110115) ou em madeira com VGS Ø9 (VGS9100 + HUS8).

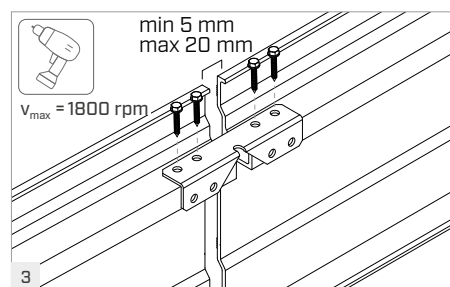
BORTB



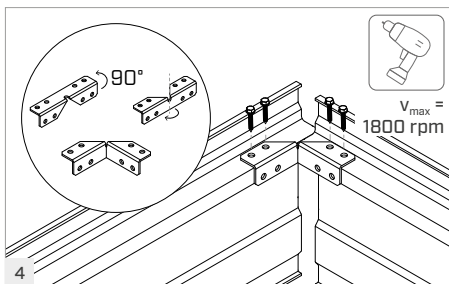
Colocar **BORTB** com o suporte contra o encosto da base **BORBASEM**. Fazer um pré-furo passante com Ø 5 mm. Utilizar a ranhura do suporte como guia para a broca do aparafusador.



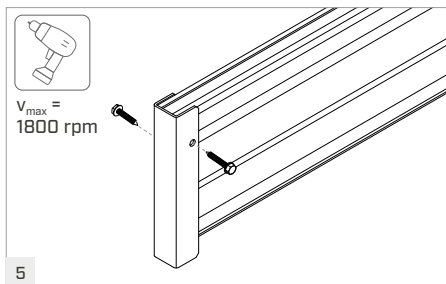
Após fazer o pré-furo, é possível fixar o rodapé à base com um parafuso **MMS5525A2**.



Unir as extremidades do **BORTB** com o conector **BORTBJUN**. Fixar com 4 parafusos **MMS5525A2**, deixando, pelo menos, 5 mm entre as tábuas para evitar deformações térmicas.



Nos cantos, rodar e dobrar o conector **BORTBJUN** com a mão até atingir o ângulo desejado. Fixar com 4 parafusos autorroscantes **MMS5525A2**.



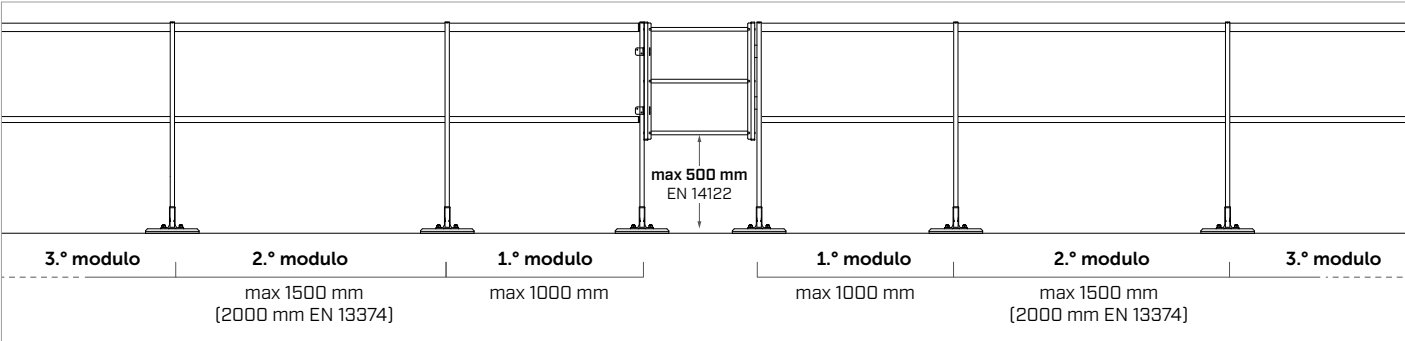
Fixar as tampas terminais do rodapé com 2 parafusos autorroscantes **MMS5525A2**.

INSTALAÇÃO DO PORTÃO BORGATE600

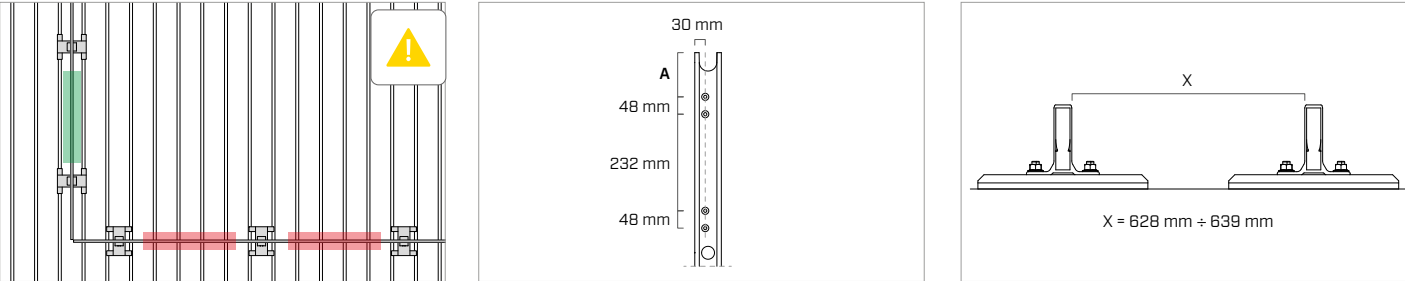
EN 13374: 2025 CIA	EN 13374: 2013 +A1: 2018 CIA	EN 13374: 2025 CIA	DBUV 201-056
-----------------------	---------------------------------	--------------------	--------------

O portão **BORGATE600** deve ser instalado de acordo com os requisitos mínimos de estabilidade do sistema. É, portanto, necessário instalar, pelo menos, três montantes de cada lado, respeitando esta distribuição máxima dos entre-eixos:

- **1.º módulo:** 1000 mm máx.
- **2.º módulo:** 1500 mm máx. (per EN 14122 3) - 2000 mm máx. (para EN 13374)
- **3.º módulo:** de acordo com as indicações da Tabela 1 – Entre-eixos



⚠ A borda inferior da portinhola deve encontrar-se a uma distância inferior a **500 mm** do plano de passagem, conforme previsto na norma EN 14122-3. Verificar a distância máxima permitida pela regulamentação aplicável (por ex., EN 13374: espaço máximo de 470 mm).



A instalação do portão em para-ventos fixados a chapa perfilada ou painel sandwich só é permitida quando o sistema for instalado paralelamente à direção das nervuras. Quando o para-vento estiver instalado perpendicularmente às nervuras, a montagem do portão não é possível.

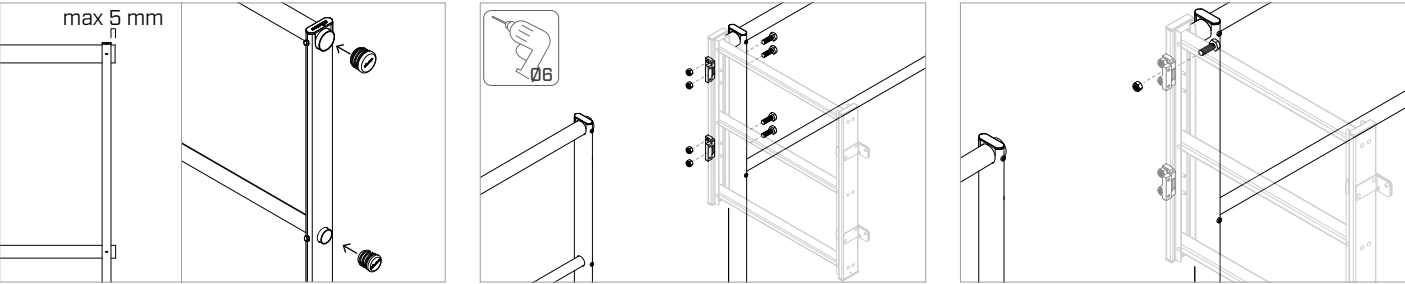
Marcar no montante as medidas indicadas no desenho⁽¹⁾ e fazer:

- **4 furos Ø 6,5 mm** no lado do portão;
- **4 furos Ø 18 mm** (mín.) no lado exterior.

⁽¹⁾ O valor A é definido em função das alturas de projeto exigidas (ver tabela abaixo).

Fixem as chapas **BORBASEM** ao solo, assegurando um entre-eixo x entre 628 mm e 639 mm.

	H montante [cm]	EN 14122-3: 2016	DBUV 201-056	EN 13374: 2025 CIA	EN 13374: 2013 +A1: 2018 CIA	DBUV 201-056	NF E85-015: 2019	OSHA 1910.29
		Valor A [mm]		Valor A [mm]				
reto/rebatível + nervura 250 mm	110		130		160		N/A	N/A
	100		130		130		N/A	N/A
reto/rebatível + nervura 333 mm	110		130		160		N/A	N/A
	100		130		130		N/A	N/A



Colocar as correntes de forma a que não sobressaiam mais de **5 mm** em relação à lateral do montante. Se necessário, cortar a parte excedente. Em seguida, colocar a tampa adequada ao tipo de **tubo** utilizado.

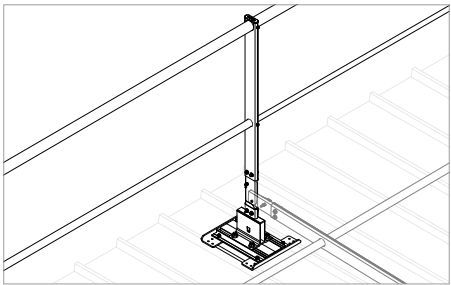
Montar o portão, utilizando os **parafusos M6** e as **porcas autoblocantes** fornecidos no saco incluído.

Para limitar o **efeito de vela** do portão em caso de vento ou durante os períodos em que não está a ser utilizado, é possível instalar um **parafuso M10 adicional** (não incluído no fornecimento) para bloquear o seu fecho de forma permanente.

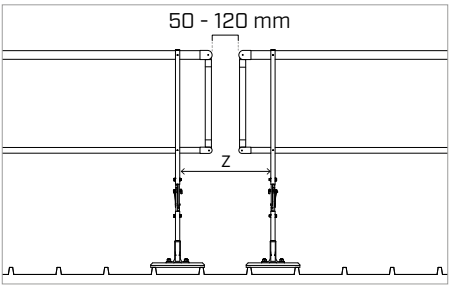
INSTALAÇÃO DO PARAPEITO REBATÍVEL

BORUP100F - BORUP110F

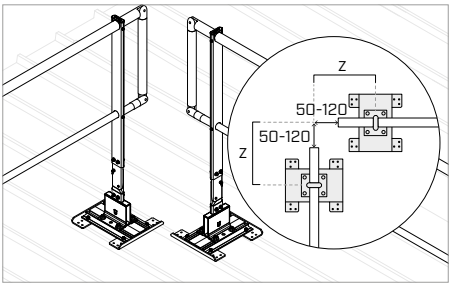
Para a instalação dos parapeitos rebatíveis, o procedimento descrito anteriormente continua a ser válido. No entanto, é necessário ter em atenção algumas instruções adicionais:



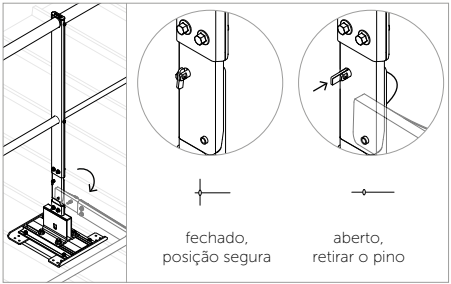
Os parapeitos rebatíveis para **BORDER M** devem ser instalados do lado da junta (não do lado do pino), de modo a que o rebatimento do montante se efetue na direção da cobertura e nunca para o exterior.



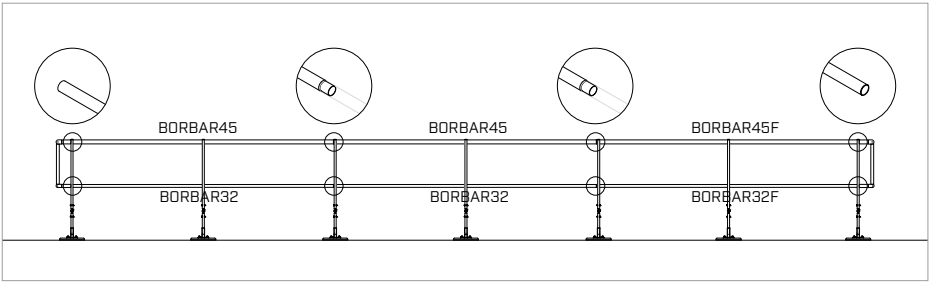
Os parapeitos rebatíveis para **BORDER M** são instalados em módulos de 9 m (7 montantes ligados) ou 12 m (9 montantes ligados). Instalar dois montantes terminais com as seguintes distâncias máximas:
BORBASEM250: $z_{max} = 500$ mm
BORBASEM333PE/PA: $z_{max} = 666$ mm
Deve ainda manter-se uma distância entre 50 e 120 mm entre as correntes terminais verticais **BORBARENDF**.



Instalar dois montantes terminais com as seguintes distâncias máximas:
BORBASEM250: $z_{max} = 250$ mm
BORBASEM333PE/PA: $z_{max} = 350$ mm
Deve ainda manter-se uma distância entre 50 e 120 mm entre as correntes terminais verticais **BORBARENDF**.



Para rebater todo o parapeito, retirar os pinos dos respetivos encaixes.



As correntes principais a utilizar são **BORBAR45** e **BORBAR32**, no entanto, cada módulo deve terminar com as correntes específicas sem redução **BORBAR45F** e **BORBAR32F**.

	EN 14122-3: 2016 DVGU 201-056	EN 13374: 2025 CIA EN 13374: 2013 +A1: 2018 CIA DVGU 201-056	NF E85-015: 2019	OSHA 1910.29
Montante H = 110 cm	BORUP110F	BORUP110FR	BORUP110F	N/A
Corrente superior	BORBAR45/F	BORBAR45R*	BORBAR45/F	N/A
Corrente intermédia	BORBAR32/F	BORBAR45R*	BORBAR32/F	N/A
Montante H = 100 cm	N/A	N/A	BORUP100F	N/A
Corrente superior	N/A	N/A	BORBAR45/F	N/A
Corrente intermédia	N/A	N/A	BORBAR32/F	N/A

* No caso de correntes terminais, em conformidade com a EN 13374, é necessário cortar a parte com redução em excesso.

AVISOS GERAIS DE UTILIZAÇÃO

- Antes de rebater o parapeito, verificar se o operador se encontra em condições de segurança. O utilizador deve estar ancorado a um dispositivo antiqueda, como uma linha de vida **PATROL** ou um ponto de ancoragem **KITE**. Além disso, é necessário garantir que todas as ferramentas e equipamentos estão em boas condições de funcionamento e que a área de instalação está desimpedida.
- Os módulos de 9 m podem ser manuseados por um único operador. Os módulos de 12 m requerem um operador adicional para que sejam corretamente rebatidos.

CÓDIGOS E DIMENSÕES

CORRENTES

CÓDIGO	d [mm]	L [mm]	
BORBAR45	45	3000	
BORBAR32	32	3000	
BORBAR45F	45	3000	
BORBAR32F	32	3000	
BORBAR45R	45	3000	
BORBARENDF	45	417	

EN AW
6063-T6

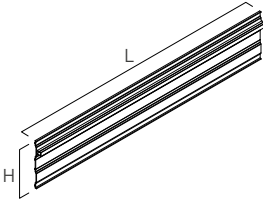
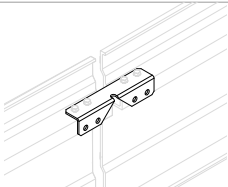
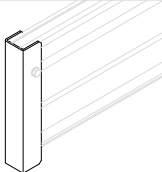
MONTANTES

CÓDIGO	H [mm]	
BORUP530WH	535	
BORUP760WH	765	
BORUP100	1005	
BORUP110	1105	
BORUP118	1185	
BORUP130	1305	
BORUP100F	1005	
BORUP110F BORUP110FR	1105	
BORUP113C	1120	
BORUP100R	1005	
BORUP110R	1105	
BORUP107US	1075	

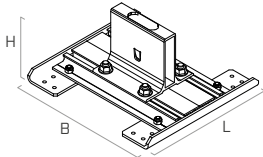
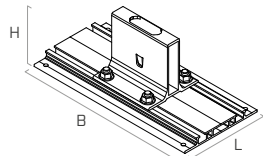
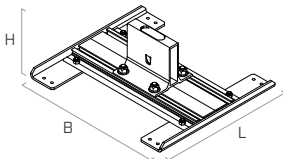
EN AW
6005A-T6

CÓDIGOS E DIMENSÕES

RODAPÉ

CÓDIGO		H [mm]	L [mm]	
BORTB	EN AW 6063-T6	150	3000	
BORTBJUN	EN AW 6063 H111	-	-	
BORTBCAP	EN AW 6063 H111	-	-	

BASES

CÓDIGO	B [mm]	H [mm]	L [mm]	
BORBASEM250	305	138,5	280	
BORBASEM333PA	365	133,5	175	
BORBASEM333PE	420	138,5	365	

FIXAÇÃO

CÓDIGO		d [mm]	H [mm]	
MMS5525A2	1.4301 AISI304 INOX	5,5	25	
RIV6320		6,3	20,2	

CÓDIGOS E DIMENSÕES

PORTÃO DE SEGURANÇA

CÓDIGO		L [mm]	H [mm]	
BORGATE600	EN AW 5083 H111	600	640	

ACESSÓRIOS

CÓDIGO			
BORCAP45			
BORCAP32	LDPE		
BORCAP			
BORCOR	PP RECYCLED		
BORWALL	PP RECYCLED 1.4301 AISI304 INOX		
EPDM253	EPDM		



ROTHO BLAAS SRL

06-26

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