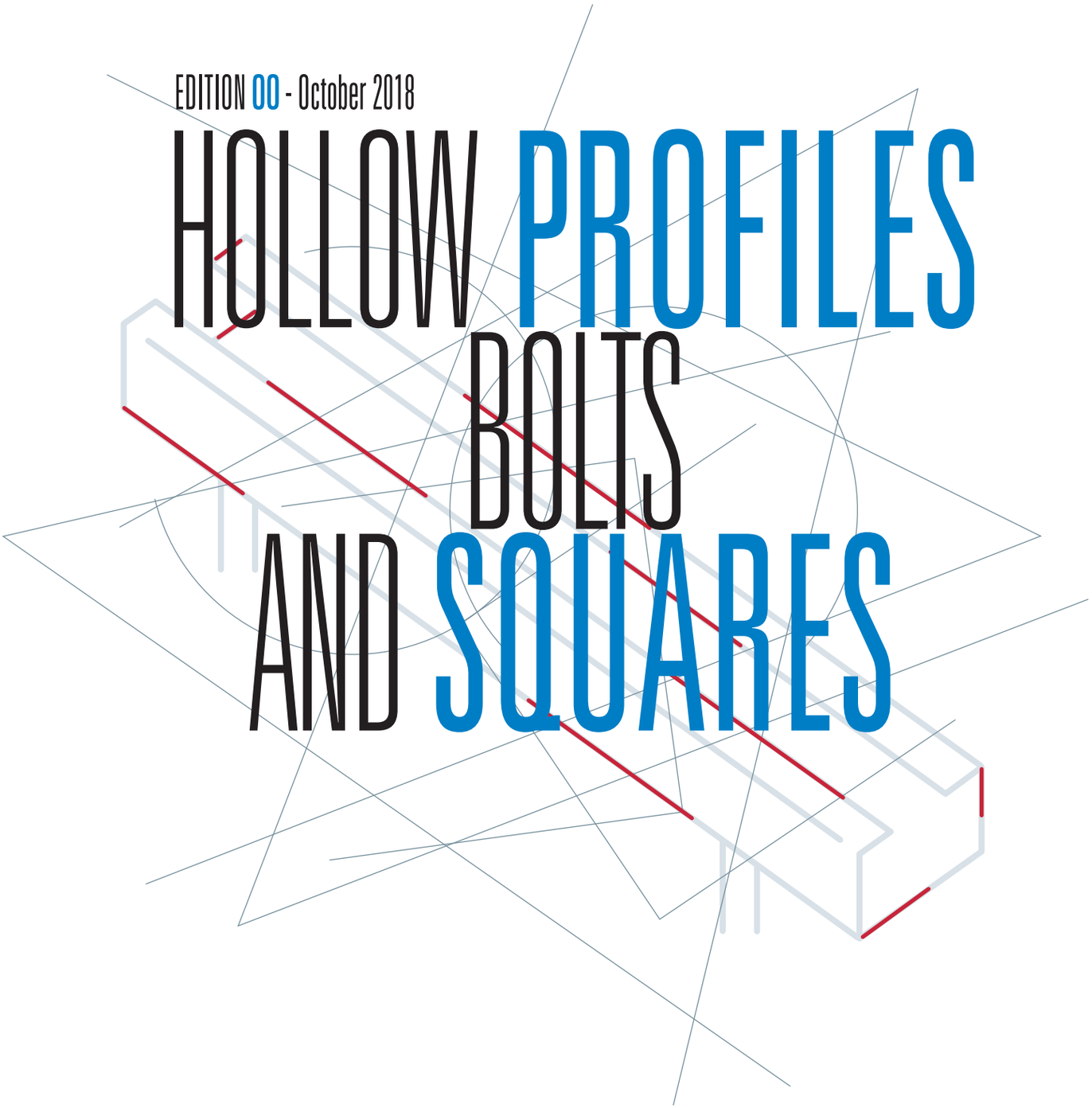
EDITION 00 - October 2018

HOLLOW PROFILES BOLTS AND SQUARES



EDILMATIC

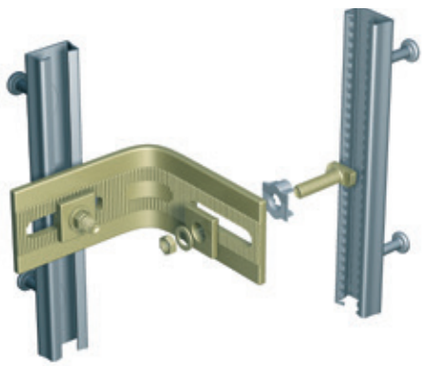
Content

1 GENERAL INFORMATION

The new General ANCHOR CHANNELS and ACCESSORIES catalogue by Edilmatic is published together with the technical regulations (NTC 2018) according to the Ministerial decree 17/01/2018 and the judgement by the European Court n. 52/11 dating back to 12-02-2018 as STARTING point and clarify the state-of-the-art as for EC labelling of its production range of Anchor channels (Anchor Channel) and accessories

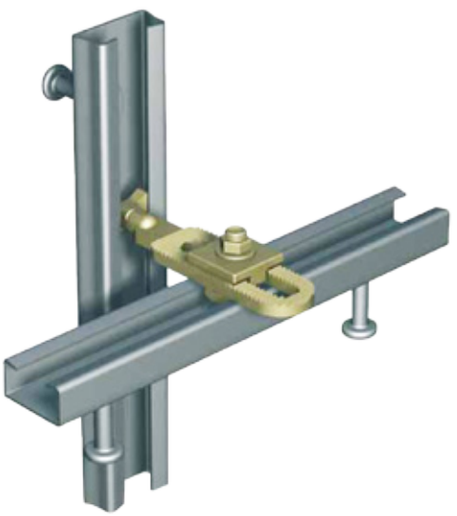
The EDILMATIC ANCHOR CHANNELS are suggested as the best solution to anchor prefab units in concrete and to fit other accessories for industrial and civil buildings.

In the catalogue 5 new types of anchor channels are introduced labelled EC with pegs, bolts, hexagon nuts and dedicated washers. The EC label is the result of the European Technical Approval (ETA) acquisition, which the product is qualified with through a standard European Assessment Procedure (EAD – European Assessment Document). The test and study results are described in the Evaluation Report approved and distributed inside the EU Community by the Deutsches Institut für Bautechnik (DIBt). The five types of channels (GF-GI-GD-GE-GM) with 4 type of bolts (TMG1-TMG2-TAG1-TAG2) allow to offer loading capacities up to limits varying from 4.9kN up to 26.6kN.



According to the European Union judgement (section eighth) published on the European Union Official Gazette n. 52/11 dating back to 12-02-2018 relating to products included in the harmonised UNI EN 1090 standards, prudently, EDILMATIC is entitled to fit the EC labelling on Anchor channels with clamps, in different sizes and shapes (Toothed channels, with welded clamps and with brackets).

Being granted the UNI EN 1090-1:2011 certification, the body of the shelf fitted with a bolt and an adjusting nut comes with the CE labelling with DOP according to the Method 1 and on request to Method 3b.



Notwithstanding such certification and the possibility to fit the EC labelling on the entire product range,reference is still made to specification in the UNI EN 9001:2015 standard, which was recently renewed, any control and testing procedure is based on for the entire company product range.

The customers can refer to the new EDILMATIC website (www.edilmatic.it) where to download from technical information (information, 3D, drawings, etc.) and regulation information (DOP, technical reports, tests, etc.)

EDILMATIC technical department is always at the customer disposal for information, requests, opinions and suggestions.

1 GENERAL INFORMATION

EDILMATIC CERTIFICATIONS

CE ETA - 16/0560

Edilmatic got in 2017 the European Technical Approval 16/0560 (ETA) foe some of its anchor channels by the German DiBt (member of EOTA).
Such approval allows to add on the channels the EC label. To get the ETA, it was necessary to follow the standard European Assessment procedure (EAD – European Assessment Document) asking for a refined and detailed testing program the product should undergo. Designers and users can be certain, then, that the Edilmatic profiles with anchoring pegs comply with the demanded features.
What is more the features of many products can be compared as they are defined with the same testing program.

The EC label certifies the ETA prescription compliance. The approved channels can therefore be used outside Italy.

CE UNI EN 1090-1:2011

In 2017 Edilmatic is granted the EN 1090-1:2011 certification. The UNI EN 1090-1 standard is an harmonised standard including the requirements for the labelling according to the European Regulation 305/2011 (CPR, Construction Products Regulation). The standard specifies the requirement relating to the compliance assessment of the performance features of structural parts in steel and aluminium as well as of kits sold on the market as building products.

The certification confirms that Edilmatic complies with any provision relating to assessment and control of the performance duration in time of any EC labelled product according to the UNI EN 1090 standard within the 2+ control system. The certification granted to Edilmatic supports the production and trading of products up to the EXC3 execution class. The EC labelled products according to the standards provides for the features/performances described in the performance statement (DOP) accompanying the product. Edilmatic can fit the EC Labelling according to the UNI EN 1090-1:2011 standard following Method 1 or 3b.

Regulation references

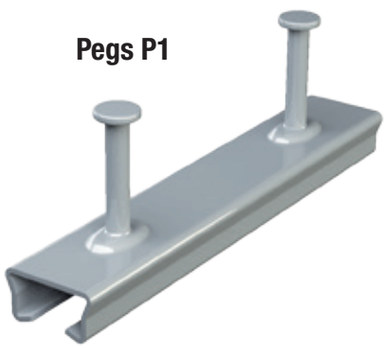
UNI EN ISO 9001:2015:	Quality management system - Requirements
UNI EN 1090-1:2011:	Requirements to assess the structural part compliance
UNI EN ISO 3834:	Welded part quality
UNI EN 1992-1:4:	Design of joints to be used on concrete Part 4-1 and Part 4-3
UNI EN 10346:	Steel sheets and ribbons to for structural parts, continuously hot-dip or sendzimir galvanised.
UNI EN 10162:	Cold shaped steel channels Prescriptions and tolerances
UNI EN 10025:	Non-alloy hot-dip or sendzimir steel laminated products for structural parts
UNI EN 10088:	Stainless steels
UNI EN ISO 2081:	Metal covering. Zinc cold electrolyte protections on iron and steel
UNI EN ISO 1461:	Hot-dip or sendzimir dip galvanising on steel parts

ANCHOR CHANNELS

MODELS

In the following paragraphs, the Edilmatic anchor channel range is introduced, including the geometrical features, performances and different types of clamping, designed to comply with the different designer requirements.

Pegs P1



ANCHOR CHANNELS WITH PEGS

CE
European Technical Approval
ETA - 16/0560

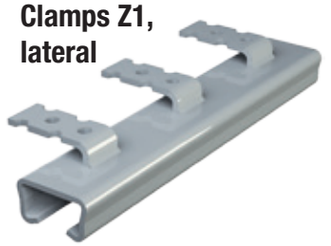
Clamps Z1 Standard

ANCHOR CHANNELS WITH WELDED CLAMPS

CE
UNI EN 1090-1

Clamps Z1, lowered

Clamps Z1, lateral

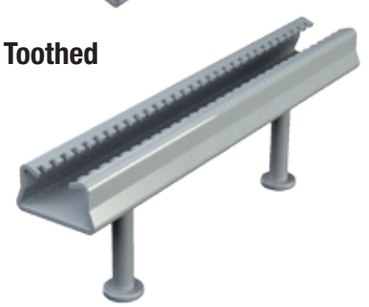


Brackets S1 and S2

ANCHOR CHANNELS WITH BRACKETS

CE
UNI EN 1090-1

Toothed



TOOTHED ANCHOR CHANNELS

CE
UNI EN 1090-1

ANCHOR CHANNELS

FEATURES

MATERIALS

	Material	Regulation	Project Information: (Mpa)	
ANCHOR CHANNELS	S280GD	UNI EN 10346 Number: 1.0244	f_{uk}	f_{yk}
			360	280
ANCHORING PEGS	C20E2C	UNI EN 10263-3 Number:1.1152	f_{uk}	f_{yk}
			360	280
Clamps Z1	S235JR	UNI EN 10025-2	f_{uk}	f_{yk}
			360	235
CONFIGURATION S1 - S2	DX51D+Z275	UNI EN 10346 Number: 1.0244	f_{uk}	f_{yk}
			360	280

FINISHES

Specifications	USE			
	Closed areas under dry conditions		Closed areas under wet conditions	
	Areas under dry conditions as houses offices, schools, hospitals, shops, ordinary Industrial buildings		Areas under dry conditions such as kitchens, bathrooms and in general structures where there is water.	
PRODUCTS	**Type of finish**	**Minimum finish thickness**	**Type of finish**	**Minimum finish thickness**
Anchor channels	hot-dip or sendzimir galvanising Sendzimir process	tR MinR:17µm tR MaxR: 21µm	hot-dip or sendzimir galvanising UNI EN ISO 1461	t ≥ 50 µm
Anchoring pegs	Electrolyte galvanising UNI EN ISO 4042	t ≥ 5 µm	Hot-dip or sendzimir galvanising UNI EN ISO 1461	t ≥ 50 µm
Clamps Z1,	Electrolyte galvanising UNI EN ISO 2081	t ≥ 5 µm	Hot-dip or sendzimir galvanising UNI EN ISO 1461	t ≥ 50 µm
Clamps S1-S2	Hot-dip or sendzimir galvanising Sendzimir process	tR MinR:17µm tR MaxR: 21µm	Hot-dip or sendzimir galvanising UNI EN ISO 1461	t ≥ 50 µm

Weight/thickness comparative table of the zinc coating

Weight (g/m2)	Thickness (micron)
70-190	5-12 on each side
275	19-21 on each side
400	28-30 on each side
500	35-38 on each side
700	47-50 on each side

Corrosion speed according to the environment

Urban ambience	2,7 µm year
Average industrial ambience	1,5 µm year
Marine ambience	1,0 µm year
Rural ambience	0,85 µm year

Table 1

Anchor channels with exposure classes relating to the environmental conditions (treated by UNI EN 206)

Anchor channel Finishes	Protection	Exposure classes and use Ambience (Suggested)
ANCHOR CHANNELS **BLACK**	**No Protection**	**1** (dry area)
ANCHOR CHANNELS, **HOT-DIP GALVANISED (SENDZIMIR)**	**Micron** 19 – 21	**3** (Wet ambience which is not directly affected by weather conditions)
ANCHOR CHANNELS with **COLD ELECTROLYTE GALVANISING**	**Micron** 5 – 12	**1 – 2** (Internal dry and/or poorly wet ambience)
ANCHOR CHANNELS in **STAINLESS STEEL NTC 304**	**Nearly Total Protection**	**5** (Chemical aggressive ambience)
ANCHOR CHANNELS with **SENDZIMIR GALVANISING (HOT DIPPING)**	**Micron** 50 – 70	**3 – 4** (Wet ambience, with frost and thawing agents)

* EDILMATIC technical department is available to provide for any additional information as for the treated subjects.

2 ANCHOR CHANNELS

STANDARD AVAILABLE LENGTHS

EDILMATIC, anchor channels in the many different models, types, with the different clamping and finishings, are available in different Length L.
They are divided in 2 categories:
Anchor channels in **PIECES - Length L between 20 cm and 1 m.**
Anchor channels in **BARS - Length L = 3 m.**

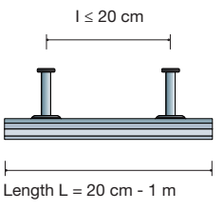
PIECES

The ANCHOR PROFILES in **PIECES** are available in any length **(min. 20 cm)**up to a maximum **1 m.**

The number of clamps depends on the length **L.**

As to provide for consistent performances, the I clamping distance between centres is never over **20 cm** (**I** ≤ 20 cm).

On demand, the following products are available:
Anchor channels in **SMOOTH pieces** (without clamps)



L min. = 20 cm
L max. = 3 m
Spacing ≤ 20 cm

BARS

ANCHOR CHANNELS in **BARS** are available in standard length**L** = 3 m

The standard clamping spacing **I** accounts for:

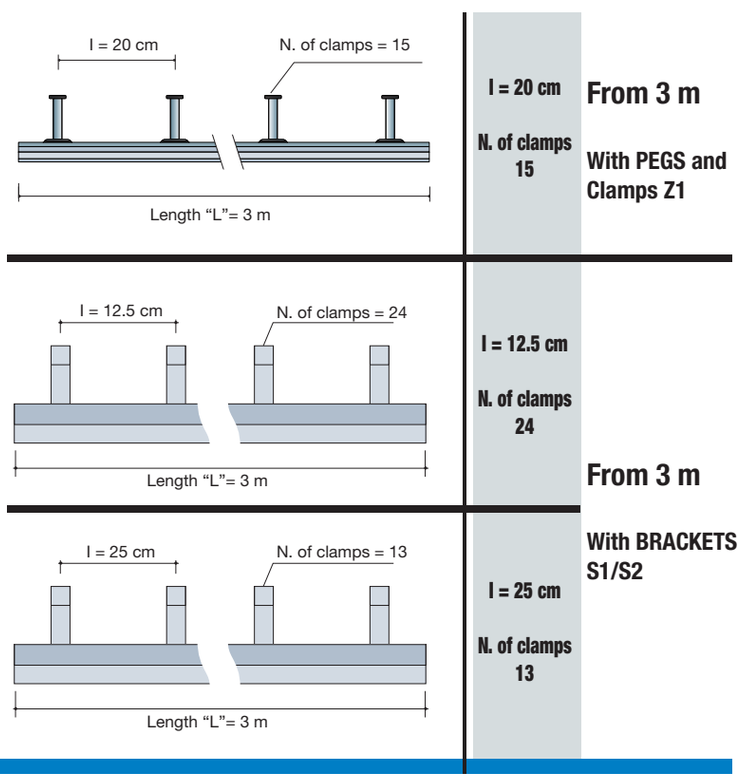
Bars with pegs = 20 cm

Bars with clamps Z1 I = 20 cm

Bars with brackets S1-S2

I = 12.5 cm (with 24 slots)

I = 25 cm (wit 13 slots)



On demand, the following products are available:

Anchor channels in **bars** in different length **L** with different spacing
Anchor channels in**PLAIN bars** (without clamps)

The EDILMATIC technical department is available to provide for any additional information as for the treated subjects.

2 ANCHOR CHANNELS

IDENTIFICATION LABELLING

The **EDILMATIC** anchor channels are labelled and therefore univocally identified as presented in the following pictures.

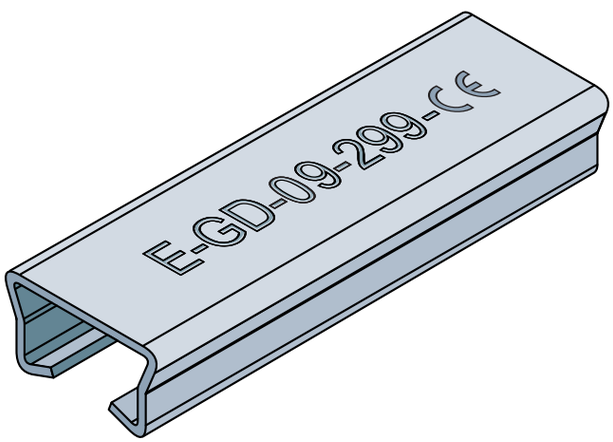
[**E– X – Y**]

E = Manufacturer identification label (Edilmatic)

X = Type of anchor channel

Y = Production batch

CE = Labelling CE



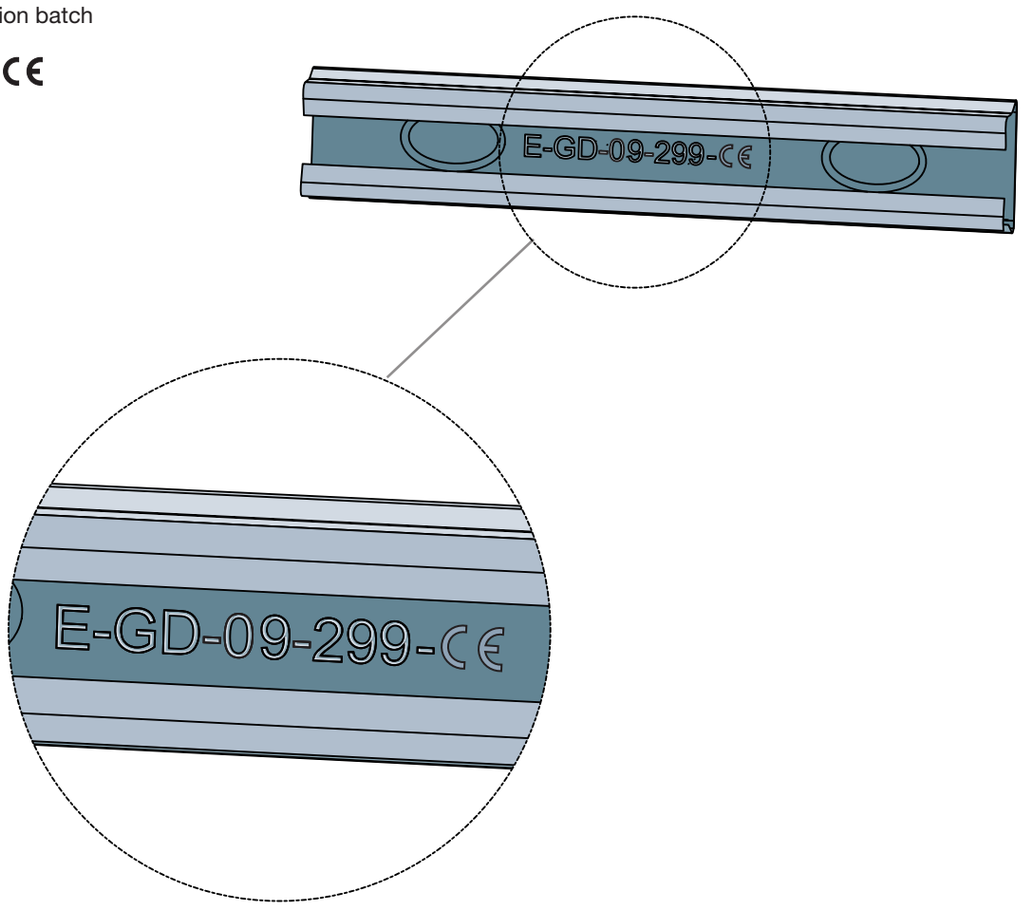
Labelling example: **E-GD-09-299-** CE

E = EDILMATIC

GD = Anchor channel, type “GD”

09-299 = Production batch

CE = Labelling CE



2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH PEGS

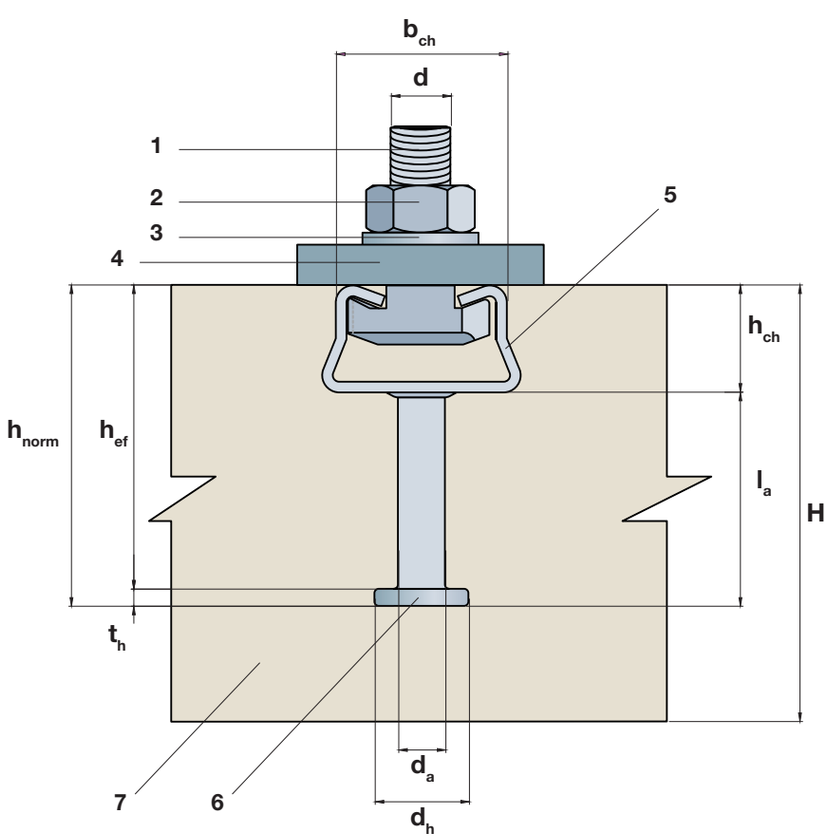
INTRODUCTION

In the following pages, there are the Edilmatic Anchor channels with pegs which were granted the European Technical Approval ETA-16/0560. The channel size included in the ETA is manufactured according to the new European standards CEN/TS 1992-4 “Anchor channel design to be used with concrete”. According to the standard, it is possible to consider the different concrete strength classes, the channel geometric conditions and any type of load.
The EC label certifies the ETA prescription compliance. The approved channels can therefore be used outside Italy. It applies mainly to the concrete prefab products, which should compulsorily comply with the EC label of the entire product.
The Edilmatic anchor channels included in the ETA-16/0560 were 5 and they are substantially different for their geometrical shapes, thickness and strength as well.

Type of anchor channel	Sizes	Design loads
GF	28x15x2.3	$N_{r,d} = V_{r,d}$ =4.9 kN
GI	38x17x3.0	$N_{r,d} = V_{r,d}$ =10.7 kN
GD	40x25x2.5	$N_{r,d} = V_{r,d}$ =10.7 kN
GE	52x30x3.3	$N_{r,d} = V_{r,d}$ =17.5 kN
GM	52x31x4	$N_{r,d} = V_{r,d}$ =26.6 kN

Legend:

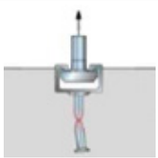
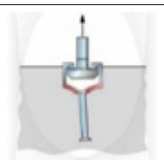
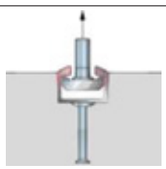
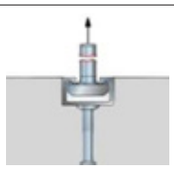
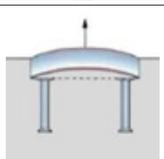
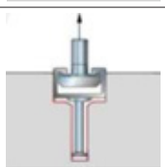
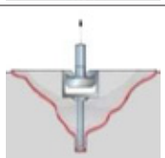
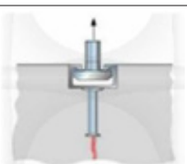
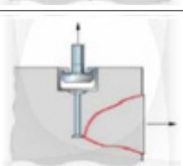
1 Bolt
2 Nut
3 Washer
4 Thickness
5 Anchor channel
6 Anchoring pegs
7 Concrete



The dimensions in the picture refer to the tables included in the present paragraph.

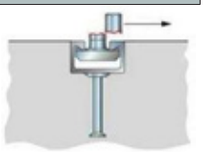
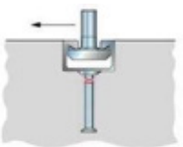
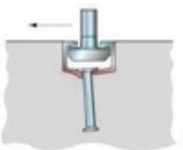
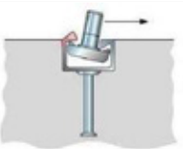
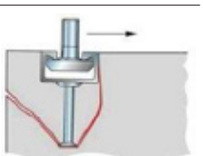
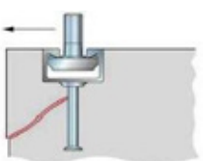
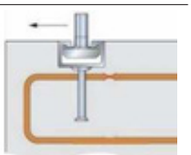
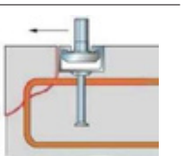
2 ANCHOR CHANNELS

TESTED PERFORMANCES: TRACTION LOADS

TYPES OF FAILURES	ELEMENTS	CHANNEL	CHANNEL-BOLT	
FAILURES STEEL	ANCHORING PEG		$N_{Ed}^{a} \le N_{Rd,s,a} = \frac{N_{RK,s,a}}{\gamma_{Ms}}$	
	CONNEXION PEG-CHANNEL		$N_{Ed}^{a} \le N_{Rd,s,a} = \frac{N_{RK,s,c}}{\gamma_{Ms,ca}}$	
	CHANNEL TABS FAILURE DUE TO BENDING	$N_{Ed}^{cb} \le N_{Rd,s,l} = \frac{N_{Rd,s,l}}{\gamma_{Ms,l}}$		
	BOLT FAILURE		$N_{Ed}^{a} \le N_{Rd,s} = \frac{N_{RK,s}}{\gamma_{Ms}}$	
	CHANNEL BENDING	$M_{Ed}^{ch} \le M_{Rd,s,flex} = \frac{M_{Rd,s,flex}}{\gamma_{Ms,flex}}$		
FAILURES CONCRETE	COLLAPSE DUE TO (PULL-OUT)		$N_{Ed}^{a} \le N_{Rd,s,p} = \frac{N_{RK,p}}{\gamma_{Mp}}$	
	FAILURE DUE TO CONCRETE CONE FAILURE		$N_{Ed}^{a} \le N_{Rd,s,c} = \frac{N_{RK,c}}{\gamma_{Mc}}$	
	FAILURE DUE TO THE CONCRETE (SPLITTING)		$N_{Ed}^{a} \le N_{Rd,sp} = \frac{N_{RK,sp}}{\gamma_{Msp}}$	
	(BLOW-OUT)		$N_{Ed}^{a} \le N_{Rd,cb} = \frac{N_{RK,cb}}{\gamma_{Mc}}$	

2 ANCHOR CHANNELS

TESTED PERFORMANCES: Cutting LOADS

TYPES OF FAILURES	ELEMENTS	CHANNEL	CHANNEL-BOLT	
FAILURES STEEL Cutting LOADS WITH NO REINFORCEMENT	BOLT		$V_{Ed}^{cb} \le V_{Rd,s} = \frac{V_{Rd,s}}{\gamma_{Ms}}$	
	ANCHORING PEGS		$V_{Ed}^{a} \le V_{Rd,s,a} = \frac{V_{RK,s,a}}{\gamma_{Ms}}$	
	CHANNEL-PEG CONNEXION		$V_{Ed}^{a} \le V_{Rd,s,c} = \frac{V_{RK,s,c}}{\gamma_{Ms,ca}}$	
	FAILURE OF THE CHANNEL TABS DUE TO BENDING	$V_{Ed}^{cb} \le V_{Rd,s,l} = \frac{V_{Rd,s,l}}{\gamma_{Ms,l}}$		
FAILURES CONCRETE Cutting LOADS WITH NO REINFORCEMENT	COLLAPSE DUE TO (PRY-OUT)		$V_{Ed}^{a} \le V_{Rd,cp} = \frac{V_{RK,cp}}{\gamma_{Mc}}$	
	COLLAPSE DUE TO CONE FAILURE EDGE CONCRETE FAILURE .		$V_{Ed}^{a} \le V_{Rd,c} = \frac{V_{RK,cp}}{\gamma_{Mc}}$	
FAILURES CONCRETE Cutting LOADS COLLAPSE	DUE TO THE STEEL FAILURE ADDITIONAL REINFORCEMENT		$N_{Ed,re}^{a} \le N_{Rd,re} = \frac{N_{RK,c}}{\gamma_{Ms,re}}$	
	COLLAPSE DUE TO THE ANCHORING FAILURE ADDITIONAL REINFORCEMENT		$N_{Ed,re}^{a} \le N_{Rd,a}$	

2 ANCHOR CHANNELS

MAIN AND PROJECT INFORMATION

REFERENCE DIMENSIONS

ANCHOR CHANNELS			GF	GI	GD	GE	GM
Real anchoring depth	h_{ef}	[mm]	46.5	59.0	69.0	91.0	126.0
Minimum spacing	s_{min}	[mm]	50.0	50.0	50.0	50.0	50.0
Maximum spacing	s_{max}	[mm]	200.0	200.0	200.0	200.0	200.0
Distance X	x	[mm]	50.0	50.0	50.0	50.0	50.0
Piece minimum length	l_{min}	[mm]	200.0	200.0	200.0	200.0	200.0
Minimum distances from the edges	$c_{min,1}$	[mm]	60.0	60.0	100.0	100.0	100.0
	$c_{min,2}$	[mm]	40.0	40.0	80.0	80.0	100.0
Minimum thickness of the concrete part	h_{min}	[mm]	100.0	100.0	150.0	150.0	200.0

TIGHTENING TORQUES

ANCHOR CHANNELS			GF	GI	GD			GE	GM
BOLTS			M12	M12	M12	M14	M16	M16	M16
Tightening torque	T_{inst}	[Nm]	15	20	30	40	40	60	60

2 ANCHOR CHANNELS

STEEL SIDE: MAIN STRENGTHS FOR THE TRACTION LOADS

ANCHOR CHANNELS			GF	GI	GD	GE	GM
Steel failure - Anchoring pegs							
strength Feature	$N_{Rk,s,a}$	[kN]	11.3	38.0	38.0	57.3	53.1
Partial safety coefficient		19			2.0		
Steel failure - anchoring/anchor channel connexion							
Strength Feature	$N_{Rk,s,a}$	[kN]	8.8	19.2	19.2	31.5	47.8
Partial safety coefficient		g_{Ms} [1)]			1.8		
Steel failure - anchor channel tabs							
Main distance for 2 bolts for Traction loads $N_{Rk,s,l}$	$S_{l,N}$	[mm]	56	76	81	104	104
Strength Feature	$N_{Rk,s,l}$	[kN]	8.8	19.2	19.2	31.5	47.8
Partial safety coefficient		g_{Ms} [1)]			1.8		
Steel failure - anchor channel bending moment							
Strength Feature	$M_{Rk,s,flex}$	[Nm]	159	288	507	938	1152
Partial safety coefficient		$g_{Ms,flex}$ [1)]			1.15		

1) In the absence of national legislative prescriptions

2 ANCHOR CHANNELS

CONCRETE SIDE: MAIN STRENGTHS FOR THE TRACTION LOADS

ANCHOR CHANNELS				GF	GI	GD	GE	GM
Concrete failure - Pull-out								
Main strengths Cracked concrete	C12/15	$N_{Rk,p}$	[kN]	7.6	22.6	22.6	31.3	34.0
Increase factor $N_{Rk,p}$ According to the cubic strength of concrete	C20/25	yc	[…]			1.67		
	C25/30					2.00		
	C30/37					2.47		
	C35/45					3.00		
	C40/50					3.33		
	C45/55					3.67		
	C50 (60)					4.00		
Non-cracked concrete increase factor		$y_{ucr,N}$	[…]			1.4		
Partial safety coefficient		$g_{Mp} = g_{Mc}$ [1)]	[…]			1.5		
Concrete failure Concrete Cone Failure $N^0_{Rk,c}$								
Factor		a_{ch}	[…]	0.82	0.85	0.87	0.90	0.95
Anchoring depth		h_{ef}	[mm]	46.5	59	69	91	126
Cracked concrete increase factor		$k_{cr,N}$	[…]	7.3	7.5	7.7	8.0	8.4
Non cracked concrete increase factor		$k_{ucr,N}$	[…]	10.4	10.7	11.0	11.5	12.0
Main distance from the borders		$c_{cr,N}$	[mm]	115	140	159	195	238
Peg main spacing		$s_{cr,N}$	[mm]	229	280	318	390	476
Partial safety coefficient		g_{Mc} [1)]				1.5		
Concrete failure - splitting								
		a_{ch}	[…]			$3{,}0h_{ef}$		

1) In the absence of national legislative prescriptions

2 ANCHOR CHANNELS

STEEL AND CONCRETE SIDE MAIN STRENGTHS FOR THE TRACTION LOADS

ANCHOR CHANNELS				GF	GI	GD	GE	GM
Steel failure - Anchoring pegs failure								
Main strengths		$V_{Rk,s,a}$	[kN]	11.3	38.0	38.0	57.3	53.1
Partial safety coefficient		$g_{Ms,a}$ [1)]	[…]			1.67		
Steel failure - anchoring/anchor channel connexion								
Main strengths		$V_{Rk,s,c}$	[kN]	8.8	19.2	19.2	31.5	47.8
Partial safety coefficient		$g_{Ms,l}$ [1)]	[…]			1.8		
Steel failure - local failure of the anchor channel tabs due to bending								
Main distance for the two bolts in case of shear compressive loads $V_{Rk,s,l}$		$S_{l,V}$	[mm]	56	76	81	104	104
Main strengths		$V_{Rk,s,l}$	[kN]	8.8	19.2	19.2	31.5	47.8
Partial safety coefficient		$g_{Ms,l}$ [1)]	[…]			1.8		
Concrete failure - pry-out								
Increase factor		K_8	[kN]	1.0	1.0	2.0	2.0	2.0
Partial safety coefficient		g_{Mc}	[…]			1.5		
Concrete break - Concrete Edge failure								
Increase factor	Cracked concrete	$k_{cr,V}$	[…]			4.5		
	Non-cracked concrete	$k_{ucr,V}$	[…]			6.3		
Main height (Channel + Peg)		$h_{cr,V}$	[mm]			$2_{c1}+2h_{ch}$		
Main anchoring peg area of influence		$s_{cr,V}$	[mm]			$4_{c1}+2b_{ch}$		
Partial safety coefficient		g_{Mc}	[…]			1.5		

1) In the absence of national legislative prescriptions

2 ANCHOR CHANNELS

DESIGN STRENGTHS

CHANNEL		$N_{Rk,s}$	$V_{Rk,s}$	$g_{M,s}$	$N_{Rd,s}$	$V_{Rd,s}$
ACRONYM	TYPE					
[-]	[-]	[kN]	[kN]	[-]	[kN]	[kN]
28/15	GF	8.8	8.8		4.9	4.9
38/18	GI	19.2	19.2		10.7	10.7
40/25	GD	19.2	19.2	1.8	10.7	10.7
52/30	GE	31.5	31.5		17.5	17.5
52/31	GM	47.8	47.8			26.6

• The values in the table refer to the general project data duly taking the minimum steel and concrete strength into account

2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH PEGS - GF

ANCHOR TYPE

GF

28X15X2.3

Supporting capacity:
$N_{r,d} = V_{r,d}$ =4.9 kN

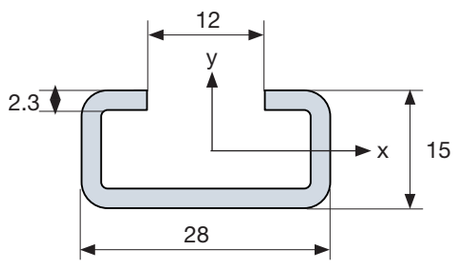
Description:

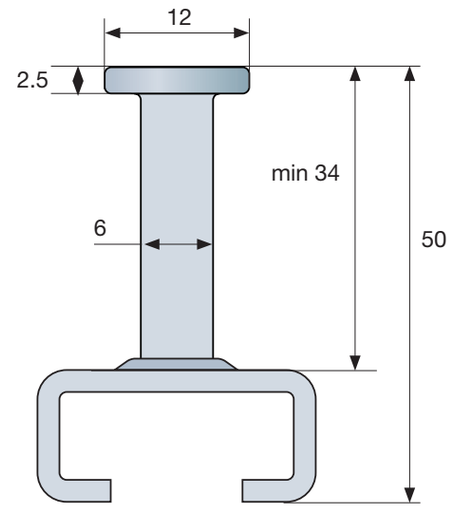
Light channel for low loads

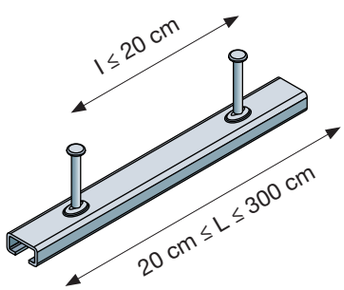
Features:

Weights (without pegs) = 1.06 kg/m.
Section = 140.8 mm^2
Moment of inertia (Jx) = 3897 mm^4
Moment of inertia (Jx) = 14660 mm^4
Plastic moment (Wpl) = 678 mm^3

CE
European Technical Approval
ETA - 16/0560





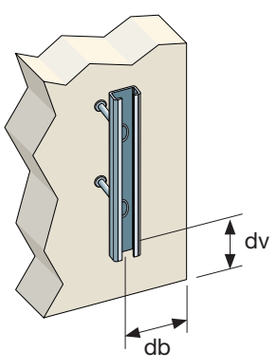


Available sizes:

L_{min} = 20 cm
L_{max} = 300 cm
l ≤ 20 cm

Minimum distances from the borders (cm)

dv	db
4	6



Available anchoring pegs	
PEGS	Peg P1 ●
	Peg P2
	Peg P3
	Peg P4

Available finishes	
FINISHES	Sandzimir galvanising ●
	Hot-dip or sendzimir galvanising ●
	Raw ●
	Inox AISI 304 ●

Available bolts	
BOLTS	TMG1 ●
	TMG2
	TAG1
	TAG2

2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH PEGS - GI

ANCHOR TYPE

GI

38X17X3.0

Supporting capacity:
$N_{r,d} = V_{r,d}$ =10.7 kN

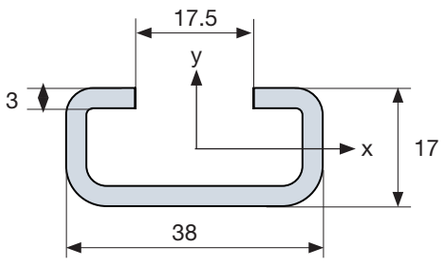
Description:

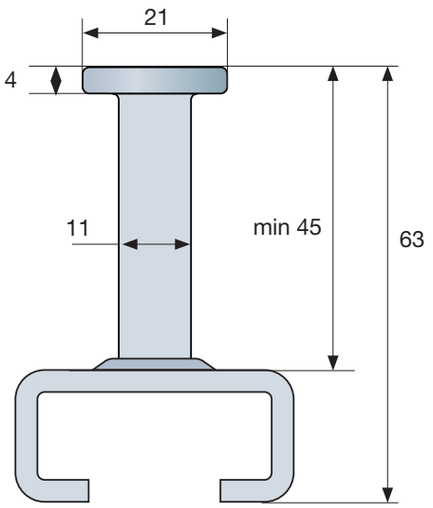
Medium-light channel for medium-low loads

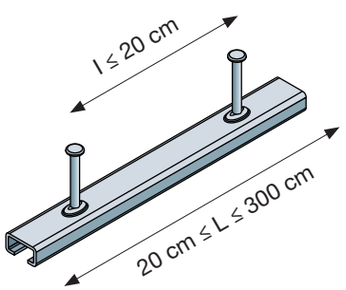
Features:

Weights (without pegs) = 1.82 kg/m.
Section = 227 mm^2
Moment of inertia (Jx) = 7914 mm^4
Moment of inertia (Jx) = 41943 mm^4
Plastic moment (Wpl) = 1226 mm^3

CE
European Technical Approval
ETA - 16/0560





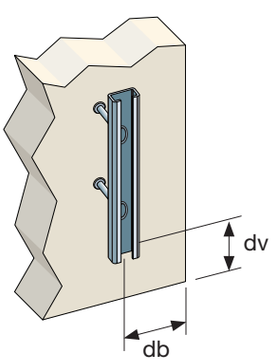


Available sizes:

L_{min} = 20 cm
L_{max} = 300 cm
l ≤ 20 cm

Minimum distances from the borders (cm)

dv	db
4	6



Available anchoring pegs	
PEGS	Peg P1
	Peg P2 ●
	Peg P3
	Peg P4

Available finishes	
FINISHES	Sandzimir galvanising ●
	Hot-dip or sendzimir galvanising ●
	Raw ●
	Inox AISI 304 ●

Available bolts	
BOLTS	TMG1
	TMG2 ●
	TAG1
	TAG2

2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH PEGS - GD

ANCHOR TYPE

GD

40X25X2.5

Supporting capacity:
$N_{r,d} = V_{r,d}$ **=10.7 kN**

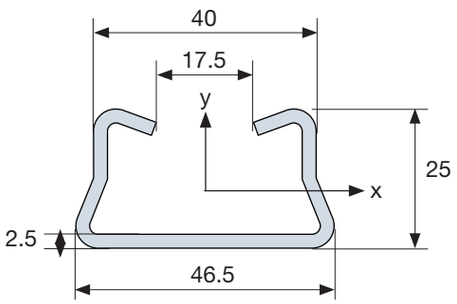
Description:

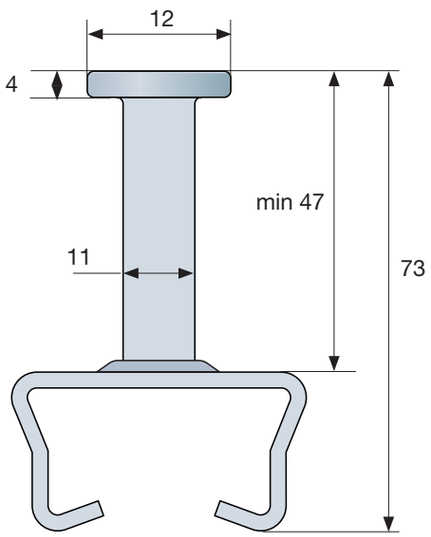
Medium-heavy channel for averagely high loads

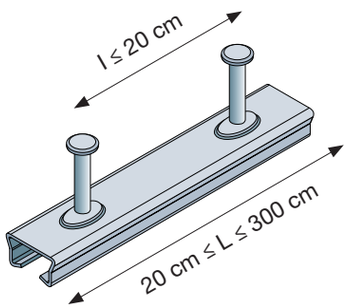
Features:

Weights (without pegs) = 2.07 kg/m.
Section = 264 mm^2
Moment of inertia (Jx) = 21054 mm^4
Moment of inertia (Jx) = 68242 mm^4
Plastic moment (Wpl) = 2158 mm^3

CE
European Technical Approval
ETA - 16/0560





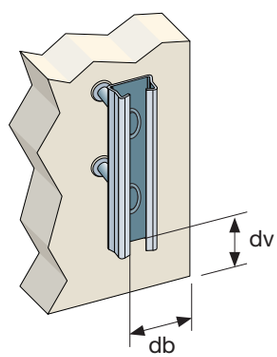


Available sizes:

L_{min} = 20 cm
L_{max} = 300 cm
l ≤ 20 cm

Minimum distances from the borders (cm)

dv	db
8	10



Available anchoring pegs	
PEGS	Peg P1
	Peg P2 ●
	Peg P3
	Peg P4

Available finishes	
FINISHES	Sandzimir galvanising ●
	Hot-dip or sendzimir galvanising ●
	Raw ●
	Inox AISI 304 ●

Available bolts	
BOLTS	TMG1
	TMG2
	TAG1 ●
	TAG2

2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH PEGS - GE

ANCHOR TYPE

GE

52X30X3.3

Supporting capacity:
$N_{r,d} = V_{r,d}$ =17.5 kN

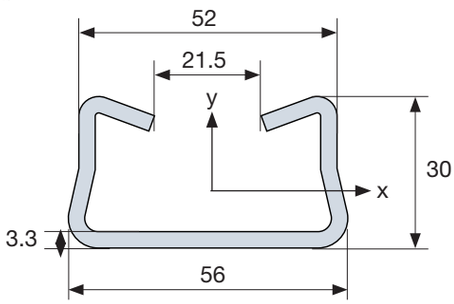
Description:

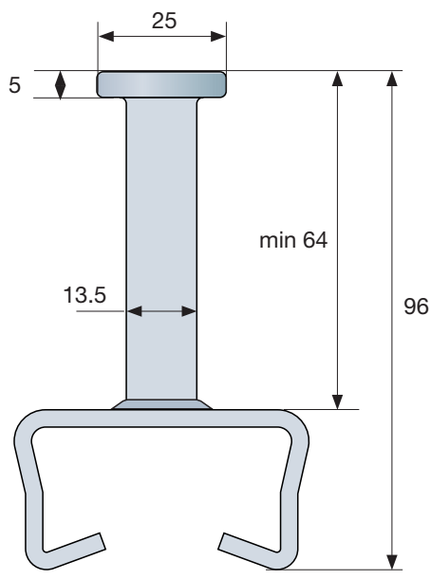
Heavy channel for high loads

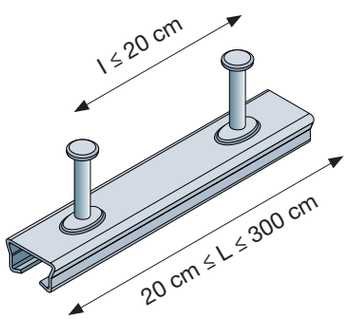
Features:

Weights (without pegs) = 3.31 kg/m.
Section = 412 mm^2
Moment of inertia (Jx) = 46388 mm^4
Moment of inertia (Jx) = 164990 mm^4
Plastic moment (Wpl) = 3993 mm^3

CE
European Technical Approval
ETA - 16/0560





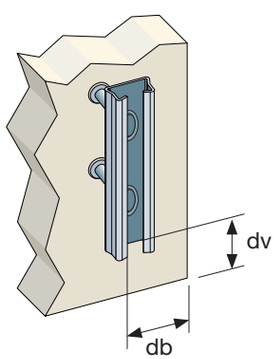


Available sizes:

L_{min} = 20 cm
L_{max} = 300 cm
l ≤ 20 cm

Minimum distances from the borders (cm)

dv	db
8	10



Available anchoring pegs		
PEGS	Peg P1	
	Peg P2	
	Peg P3	●
	Peg P4	

Available finishes		
FINISHES	Sandzimir galvanising	●
	Hot-dip or sendzimir galvanising	●
	Raw	●
	Inox AISI 304	●

Available bolts		
BOLTS	TMG1	
	TMG2	
	TAG1	
	TAG2	●

2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH PEGS - GM

ANCHOR TYPE

GM

52X31X4

Supporting capacity:
$N_{r,d} = V_{r,d}$ **=26.6 kN**

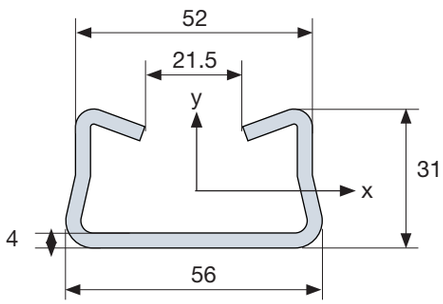
Description:

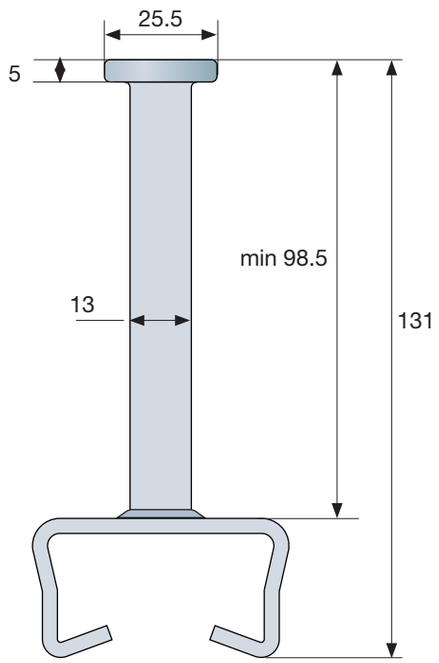
Heavy channel for consistently high loads

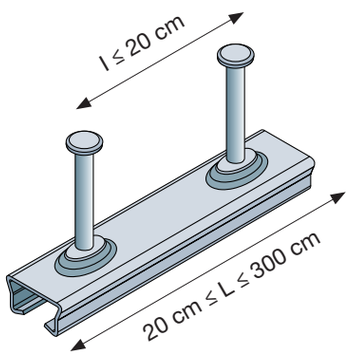
Features:

Weights (without pegs) = 3.9 kg/m.
Section = 498 mm^2
Moment of inertia (Jx) = 57839 mm^4
Moment of inertia (Jx) = 197000 mm^4
Plastic moment (Wpl) = 4900 mm^3

CE
European Technical Approval
ETA - 16/0560





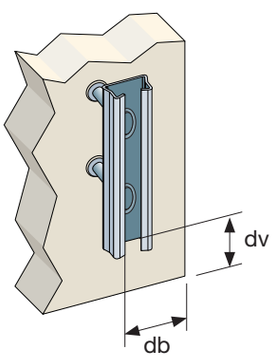


Available sizes:

L_{min} = 20 cm
L_{max} = 300 cm
l ≤ 20 cm

Minimum distances from the borders (cm)

dv	db
10	10



Available anchoring pegs	
PEGS	Peg P1
	Peg P2
	Peg P3
	Peg P4 ●

Available finishes	
FINISHES	Sandzimir galvanising ●
	Hot-dip or sendzimir galvanising ●
	Raw ●
	Inox AISI 304 ●

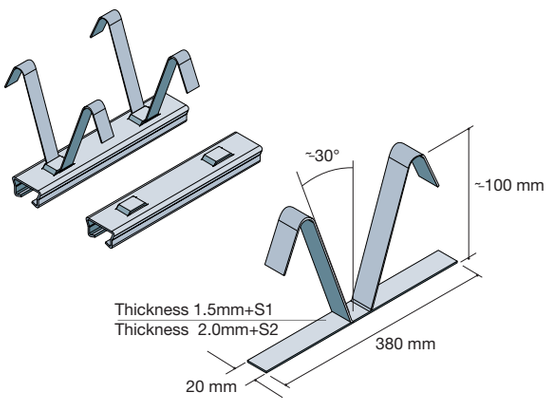
Available bolts	
BOLTS	TMG1
	TMG2
	TAG1
	TAG2 ●

2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH A DIFFERENT GALVANISING

The EDILMATIC anchor channels in the different types and finishings are available beside with pegs presented in the previous chapter, with two different types of CLAMPINGS:
Brackets S1 and S2
WELDED Clamps Z1 (Standard - Lateral - Lowered)

ANCHOR CHANNELS WITH SLOTS FOR Clamps S1/S2



These anchor channels exhibit slots on the back

where **to fit Clamps S1/S2**. Clamps obtained from coils in **Steel DX51D+Z** (UNI EN 10346) hot-dip galvanised with Sendzimir method. 2 versions are available:
S1 for channels GD - Thickness 1.5 mm
S2 for channels GD - Thickness 2.0 mm

The Anchor channels are available in **PIECES** and/or in **BARS**.

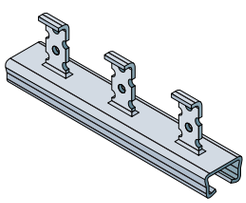
In **PIECES** they are available in any lengths
with minimum **L = 20 cm**up to maximum **L = 1 m**.
spacing **I** ≤ **20 cm**.

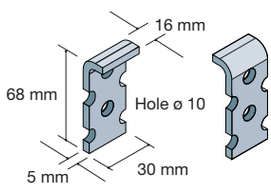
ANCHOR CHANNELS in **BARS** are available in standard length
L = **3 m**

clampings distance between centres **I = 12,5 cm or 25 cm**

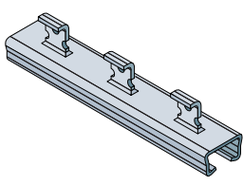
ANCHOR CHANNELS WITH WELDED Clamps Z1

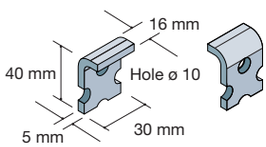
standard



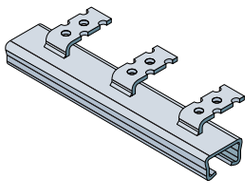


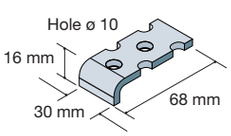
lowered





lateral





These are special clamps, duly shaped obtained through the **Steel S235JR1** (UNI EN 10025) casting, fitted to the back of the anchor channels and then cold electrolytically galvanised according to UNI EN ISO 2081 (hot-dip according to UNI EN ISO 1461 only on request).

On the three versions (standard - lowered - lateral), with the same capacity of the Pegs P1, they allow to comply with the different requested requirements.

It is a special production to be scheduled on request only for anchor profiles: **GD - GE - GM**.

They are available in **PIECES** and/or in **BARS**.

In **PIECES** they are available in any length
with minimum **L = 20 cm** up to maximum **L = 1 m**.
spacing **I** ≤ **20 cm**.

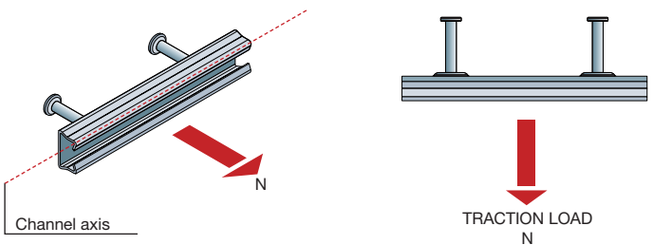
In **BARS** they are available in standard length**L** = 3 m
spacing **I = 20 cm.**

The EDILMATIC technical department is available to provide for any additional information as for the treated subjects.

2 ANCHOR CHANNELS

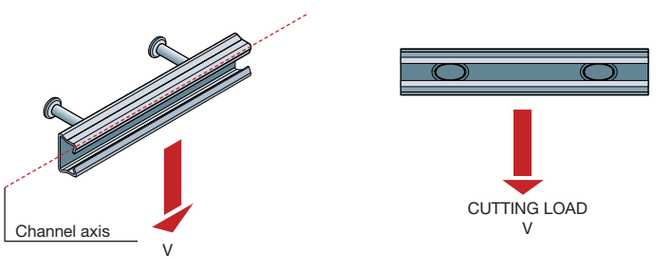
TRACTION LOAD

Single load **PERPENDICULARLY** applied against the ANCHOR PROFILE longitudinal axis



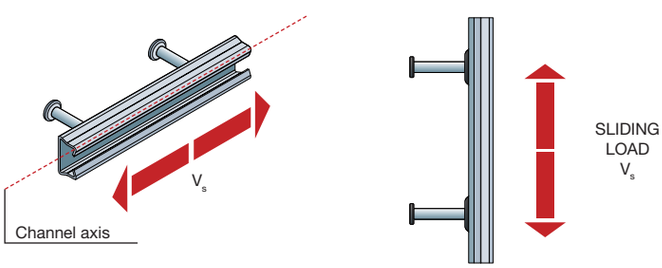
CUTTING LOAD

Single load **TRANSVERSALLY** applied against the ANCHOR PROFILE longitudinal axis



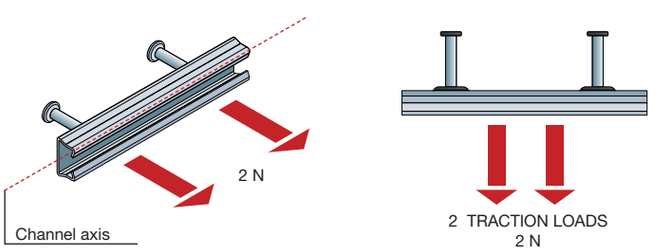
SLIDING LOAD

Single load applied in **PARALLEL** against the ANCHOR PROFILE longitudinal axis



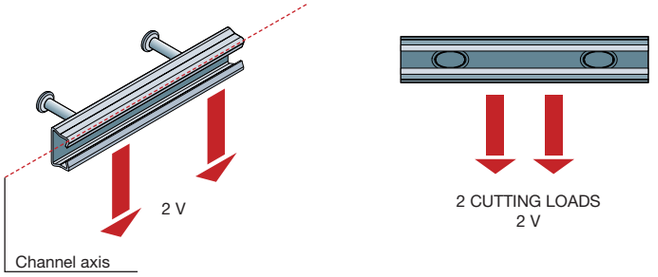
2 TRACTION LOADS

2 single or distributed loads **PERPENDICULARLY** applied against the ANCHOR PROFILE longitudinal axis



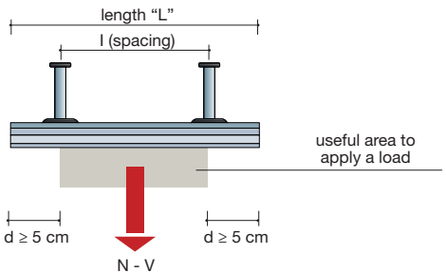
2 CUTTING LOADS

Single or distributed loads **TRANSVERSALLY** applied against the ANCHOR PROFILE longitudinal axis

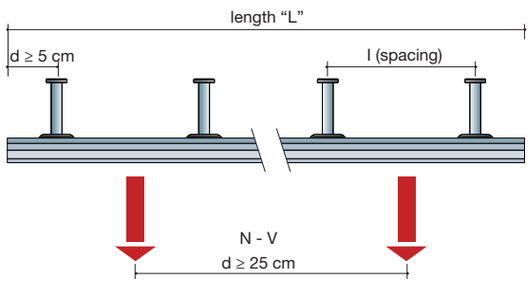


2 ANCHOR CHANNELS

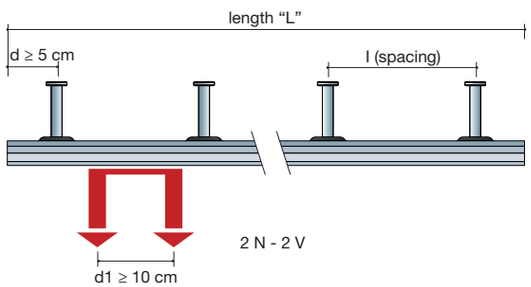
The single area where to apply the **SINGLE LOADS** (both traction **N** and cutting **V** loads) is between the spacing of the clamps on the channel borders. They are applied at a distance (**d**) from the channel border accounting for ≥ a **5 cm.**



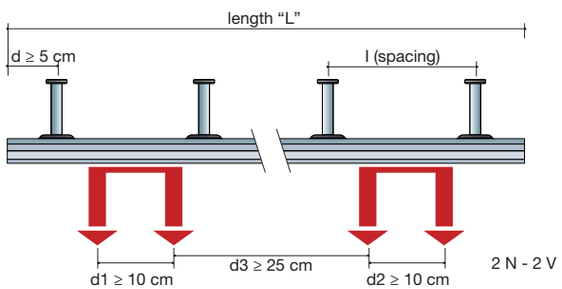
In case more than one **SINGLE LOAD is applied** (traction **N** and cutting **V** loads), the area where to apply the load is between the clamps fitted to the channel profiles. The minimum distance (**d**) between the loads must be ≥ **25 cm.**



In case **COUPLES OF LOADS** are applied (traction **2 N** and shear compressive **2 V** loads) the minimum distance (**d1**) between the loads must be ≥ to **10 cm.**

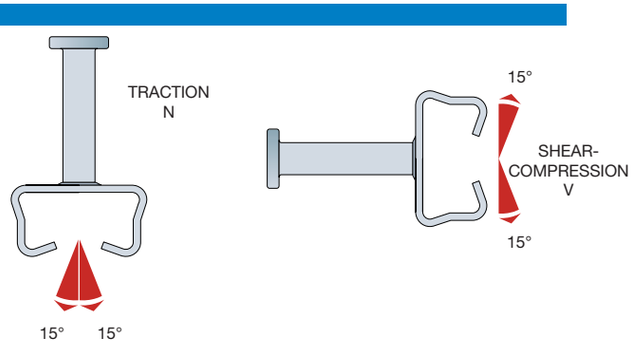


In case more **COUPLES OF LOADS** are applied (traction **2 N** and shear compressive **2 V** loads) the minimum distance (**d3**) between the loads must be ≥ to **25 cm.**



The maximum allowed bending to apply **TRACTION LOADS N** (perpendicular to the channel axis) accounts for **15°.**

The maximum allowed bending to apply **Cutting LOADS V** (transversal to the channel axis) accounts for **15°.**



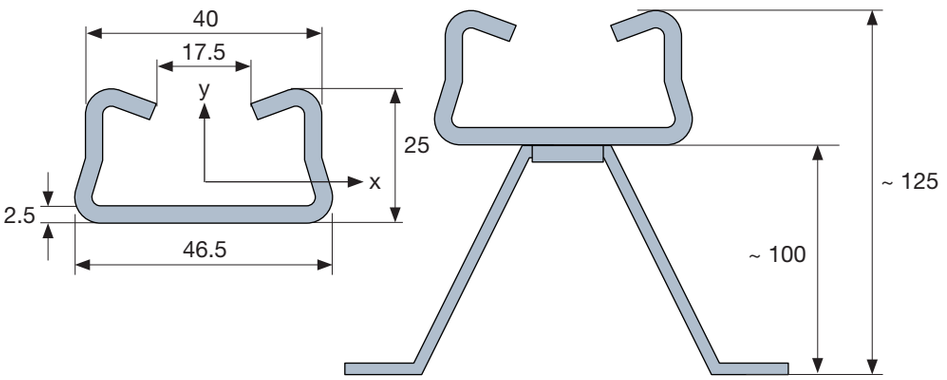
2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH CLAMPS - GD + CLAMPS S1

ANCHOR TYPE

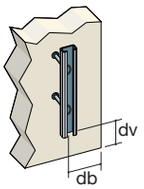
GD

40X25X2.5



Description:
Medium-heavy channel for averagely high loads

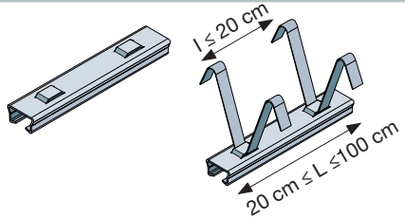
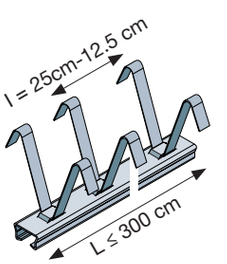
Features:
Weight = 2.07 Kg/m.
Section = 264 mm^2
Moment of inertia (J_x) = 21054 mm^4
Moment of inertia (J_y) = 68242 mm^4
Plastic moment (W_{pl}) = 2158 mm^3



Minimum distances from the borders (cm)

dv	db
8	10

CE
EN 1090-1:2011

APPLICABLE LOADS	N	V	2N	2V
PIECES (with Brackets S1)	**TRACTION**	**SHEAR-COMPRESSION**	**2 TRACTION LOADS**	**2 Cutting LOADS**
	**SINGLE LOAD N_{Rd} 10.7 kN**	**SINGLE LOAD V_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**
BARS L = 3 m (with clamps S1)	**TRACTION**	**SHEAR-COMPRESSION**	**2 TRACTION LOADS**	**2 Cutting LOADS**
 spacing 12.5 cm ± 24 clamping	**SINGLE LOAD N_{Rd} 10.7 kN**	**SINGLE LOAD V_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**
spacing 25 cm ± 13 clamping	**SINGLE LOAD N_{Rd} 10.7 kN**	**SINGLE LOAD V_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**

Available finishes	
FINISHES	Sandzimir galvanising ●
	Hot-dip or sendzimir galvanising ●
	Black (without galvanising) ●

Available bolts	
BOLTS	TMG1
	TMG2
	TAG1 ●
	TAG2

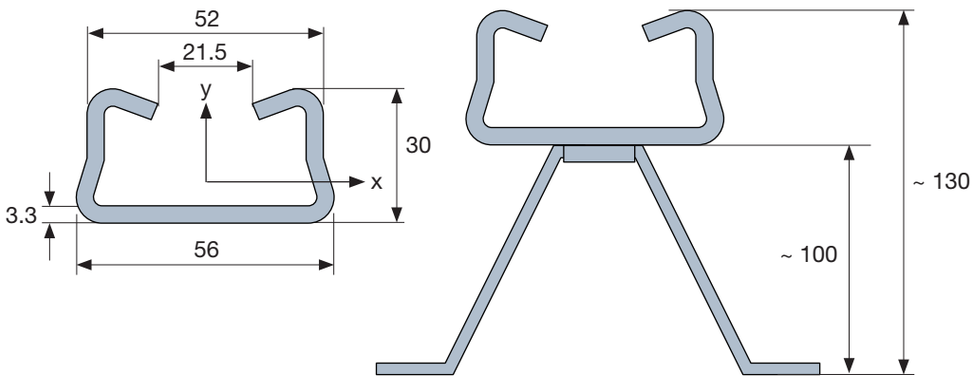
2 ANCHOR CHANNELS

ANCHOR CHANNELS WITH CLAMPS - GD + CLAMPS S2

ANCHOR TYPE

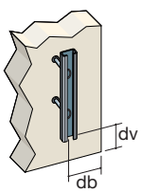
GE

52X30X3.3



Description:
Medium-heavy channel for averagely high loads

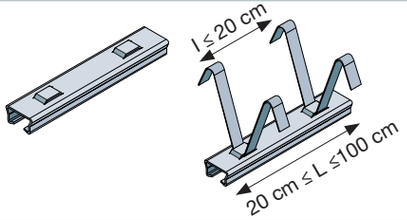
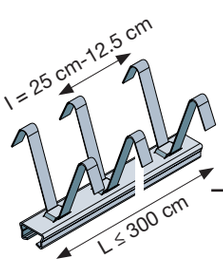
Features:
Weight = 3.31 Kg/m.
Section = 412 mm^2
Moment of inertia (J_x) = 46388 mm^4
Moment of inertia (J_y) = 164990 mm^4
Plastic moment (W_{pl}) = 3993 mm^3



Minimum distances from the borders (cm)

dv	db
8	10

CE
EN 1090-1:2011

APPLICABLE LOADS	N	V	2N	2V
PIECES (with Brackets S2)	TRACTION	SHEAR-COMPRESSION	2 TRACTION LOADS	2 Cutting LOADS
	SINGLE LOAD N_{Rd} 17.5 kN	SINGLE LOAD V_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN
BARS L = 3 m (with clamps S2)	TRACTION	SHEAR-COMPRESSION	2 TRACTION LOADS	2 Cutting LOADS
 spacing 12.5 cm ± 24 clamping	SINGLE LOAD N_{Rd} 17.5 kN	SINGLE LOAD V_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN
spacing 25 cm ± 13 clamping	SINGLE LOAD N_{Rd} 17.5 kN	SINGLE LOAD V_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN

Available finishes	
FINISHES	Sandzimir galvanising ●
	Hot-dip or sendzimir galvanising ●
	Black (without galvanising) ●

Available bolts	
BOLTS	TMG1
	TMG2
	TAG1
	TAG2 ●

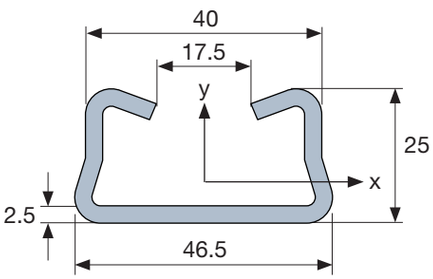
2 ANCHOR CHANNELS

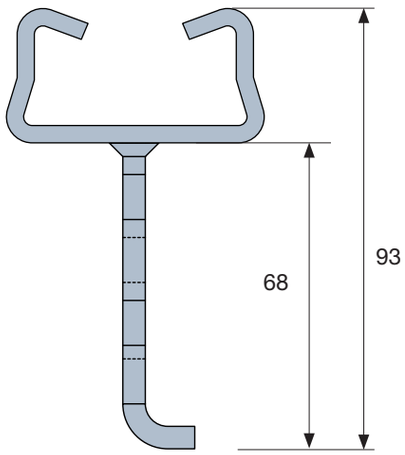
ANCHOR CHANNELS WITH WELDED CLAMPS GD + CLAMPS Z1

ANCHOR TYPE

GD

40X25X2.5

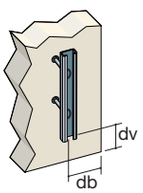




Description:
Medium-heavy channel for averagely high loads

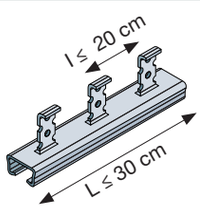
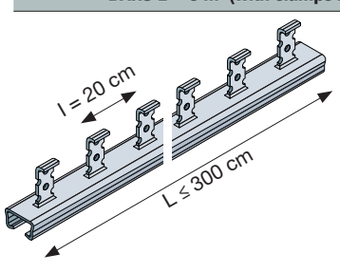
Features:
Weight = 2.07 Kg/m.
Section = 264 mm^2
Moment of inertia (J_x) = 21054 mm^4
Moment of inertia (J_y) = 68242 mm^4
Plastic moment (W_{pl}) = 2158 mm^3

CE
EN 1090-1:2011



Minimum distances from the borders (cm)

dv	db
8	10

APPLICABLE LOADS	N	V	2N	2V
PIECES (with Clamps Z1)	**TRACTION**	**SHEAR-COMPRESSION**	**2 TRACTION LOADS**	**2 Cutting LOADS**
	**SINGLE LOAD N_{Rd} 10.7 kN**	**SINGLE LOAD V_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**
BARS L = 3 m (with clamps Z1)	**TRACTION**	**SHEAR-COMPRESSION**	**2 TRACTION LOADS**	**2 Cutting LOADS**
 spacing 20 cm ± 15 clamping	**SINGLE LOAD N_{Rd} 10.7 kN**	**SINGLE LOAD V_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**	**SINGLE LOAD 2 N_{Rd} 10.7 kN**

Available finishes	
FINISHES	Electrolyte galvanising ●
	Hot-dip or sendzimir galvanising ●
	Black (without galvanising) ●

Available bolts	
BOLTS	TMG1
	TMG2
	TAG1 ●
	TAG2

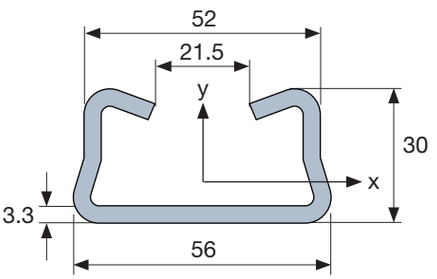
2 ANCHOR CHANNELS

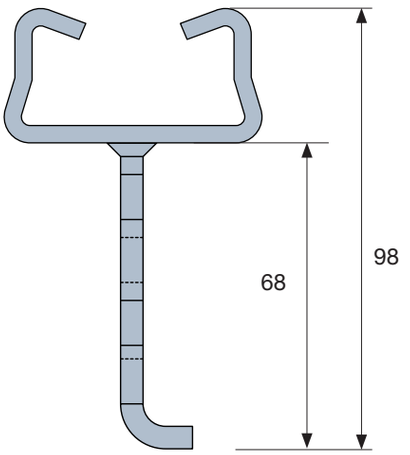
ANCHOR CHANNELS WITH WELDED CLAMPS GE + CLAMPS Z1

ANCHOR TYPE

GE

52X30X3.3

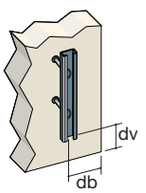




Description:
Medium-heavy channel for averagely high loads

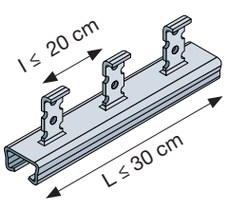
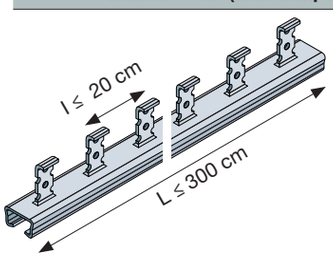
Features:
Weight = 3.31 Kg/m.
Section = 412 mm^2
Moment of inertia (J_x) = 46388 mm^4
Moment of inertia (J_y) = 164990 mm^4
Plastic moment (W_{pl}) = 3993 mm^3

CE
EN 1090-1:2011



Minimum distances from the borders (cm)

dv	db
8	10

APPLICABLE LOADS	N	V	2N	2V
PIECES (with Clamps Z1)	TRACTION	SHEAR-COMPRESSION	2 TRACTION LOADS	2 Cutting LOADS
	SINGLE LOAD N_{Rd} 17.5 kN	SINGLE LOAD V_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN
BARS L = 3 m (with clamps Z1)	TRACTION	SHEAR-COMPRESSION	2 TRACTION LOADS	2 Cutting LOADS
 spacing 20 cm ± 15 clamping	SINGLE LOAD N_{Rd} 17.5 kN	SINGLE LOAD V_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN	SINGLE LOAD 2 N_{Rd} 17.5 kN

Available finishes		
FINISHES	Electrolyte galvanising	●
	Hot-dip or sendzimir galvanising	●
	Black (without galvanising)	●

Available bolts		
BOLTS	TMG1	
	TMG2	
	TAG1	
	TAG2	●

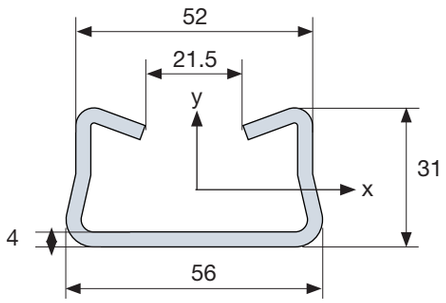
2 ANCHOR CHANNELS

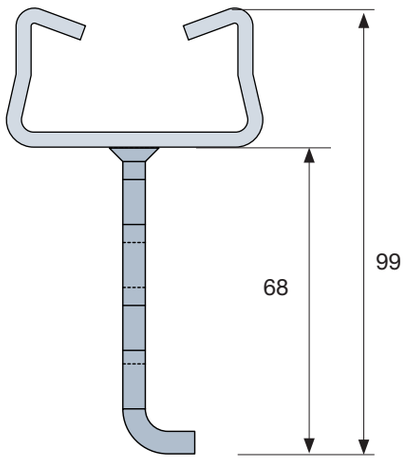
ANCHOR CHANNELS WITH WELDED CLAMPS GM + CLAMPS Z1

ANCHOR TYPE

GM

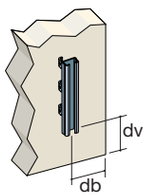
52X31X4





Description:
Medium-heavy channel for averagely high loads

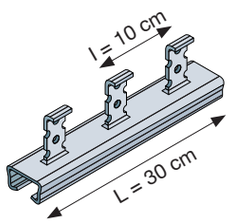
Features:
Weight = 3.9 Kg/m.
Section = 498 mm^2
Moment of inertia (J_x) = 57839 mm^4
Moment of inertia (J_y) = 197000 mm^4
Plastic moment (W_{pl}) = 4900 mm^3



CE
EN 1090-1:2011

Minimum distances from the borders (cm)

dv	db
10	10

APPLICABLE LOADS	N	V	2N	2V
PIECES (with Clamps Z1)	TRACTION	SHEAR-COMPRESSION	2 TRACTION LOADS	2 Cutting LOADS
	SINGLE LOAD N_{Rd} 26.6 kN	SINGLE LOAD V_{Rd} 26.6 kN	SINGLE LOAD 2 N_{Rd} 26.6 kN	SINGLE LOAD 2 N_{Rd} 26.6 kN

Available finishes	
FINISHES	Electrolyte galvanising ●
	Hot-dip or sendzimir galvanising ●
	Black (without galvanising) ●

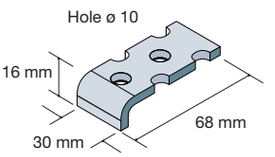
Available bolts	
BOLTS	TMG1
	TMG2
	TAG1
	TAG2 ●

2 ANCHOR CHANNELS

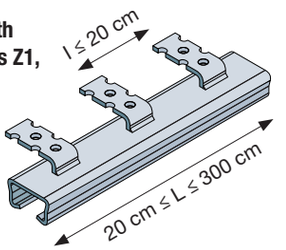
ANCHOR CHANNELS WITH WELDED CLAMPS: SPECIAL APPLICATIONS

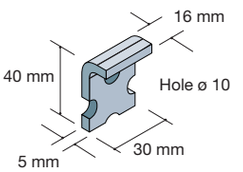
ANCHOR CHANNELS WITH WELDED Clamps Z1 are special parts available for Anchor channels GD - GE - GM for all the standard lengths (in pieces and/or in bars, 3 m), as reported in the pages of the present catalogue.

For specific applications, in case of parts in CLS, in extremely reduced thickness and/or very thin, 2 special version of Clamp Z1 are available, **lowered Clamp Z1 and lateral Clamp Z1 ,** applicable on set profiles, offering reduced sizes and specific static performances which are higher in comparison to the lower thickness they are fitted to.

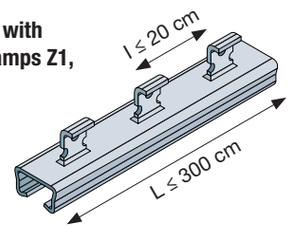


Profiles with Lateral clamps Z1,





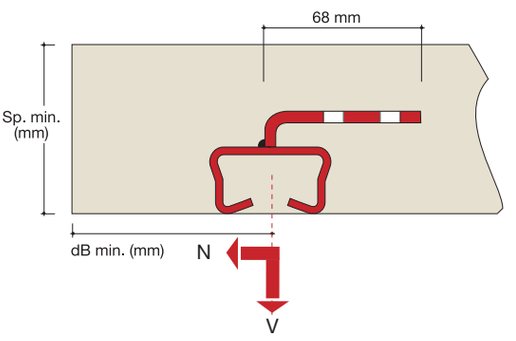
Profiles with lowered clamps Z1,



LATERAL Z1 CLAMP

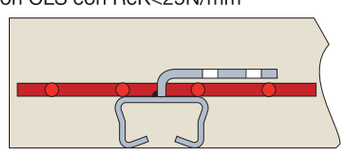
Anchor channels with lateral clamps Z1 are suitable for application on thin and long parts, possible undergoing only anchoring loads. The maximum applicable loads to a CLS are RcK≥25N/mm²

For the CLS with lower classes, an additional reinforcement is to be considered.



The maximum applicable loads specified in the table (Pmax) apply for CLS with a minimum class RcK≥25N/mm²			 N	 V
Type of channel	**Thickness min. (mm)**	**Db min. (mm)**	**TRACTION (kN)**	**SHEAR-COMPRESSION (kN)**
Channel type GD 40x25x2.5)	60	80	N_{Rd} **9 kN**	V_{Rd} **9 kN**
Channel type GM 52x31x4)	80	100	N_{Rd} **10 kN**	V_{Rd} **10 kN**

Armatura aggiuntiva (tondi e/ rete elettrosaldata) con CLS con RcK<25N/mm²

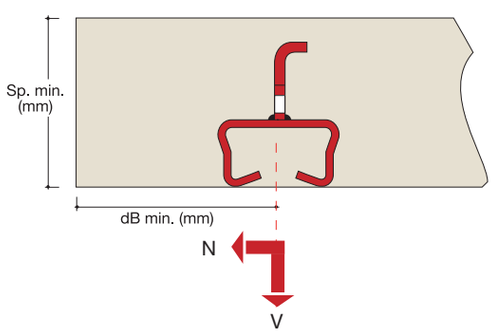


LOWERED Z1 CLAMP,

The Anchor channels with Lowered clamps Z1 are suitable for application to thin parts which are can be used as anchoring parts as well.

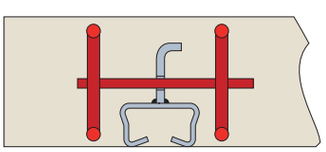
The maximum applicable loads to a CLS are RcK≥25N/mm²

For the CLS with lower classes, an additional reinforcement is to be considered.



The maximum applicable loads specified in the table (Pmax) apply for CLS with a minimum class RcK≥25N/mm²			 N	 V
Type of channel	**Thickness min. (mm)**	**Db min. (mm)**	**TRACTION (kN)**	**SHEAR-COMPRESSION (kN)**
Channel type GD 40x25x2.5)	90	90	N_{Rd} **10 kN**	V_{Rd} **10 kN**
Channel type GM 52x31x4)	100	100	N_{Rd} **11 kN**	V_{Rd} **11 kN**

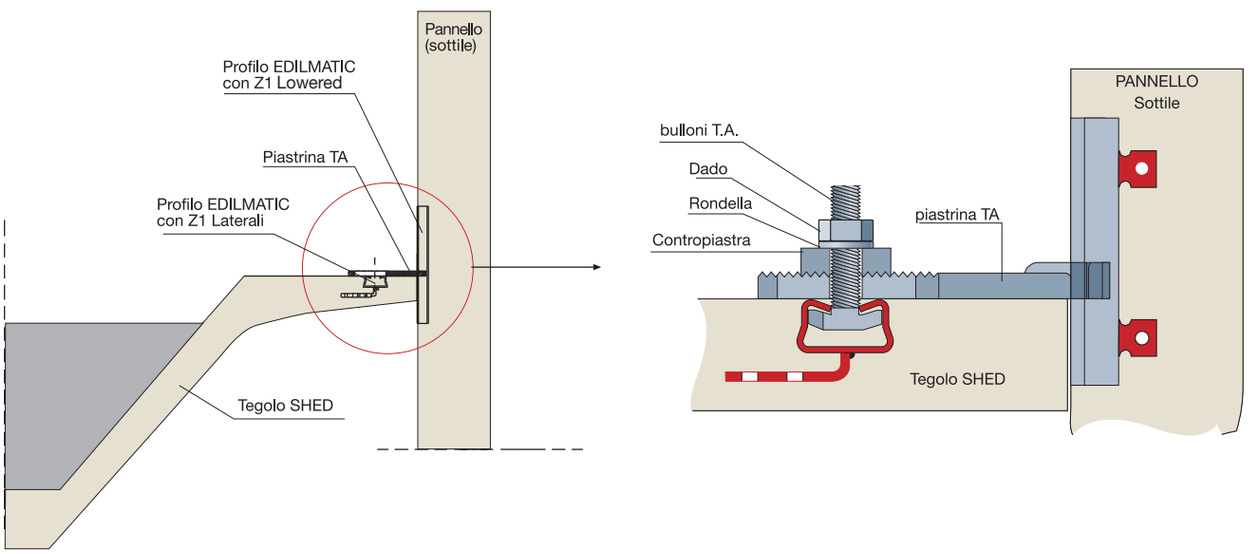
Armatura aggiuntiva (tondino e/o staffatura) con CLS con RcK<25N/mm²



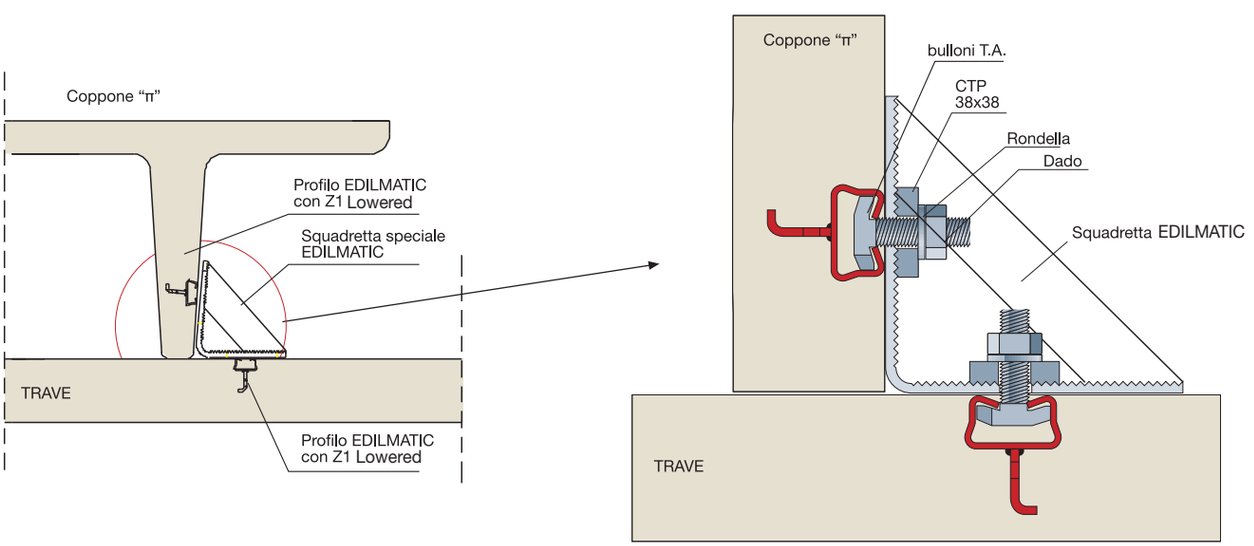
2 ANCHOR CHANNELS

EXAMPLES OF APPLICATIONS

EXAMPLE 1
Retention of SHED thin covering channels in the tab area with TA plates and Edilmatic accessories



EXAMPLE 2
Covering tile fitting, "π" to the Beam in the groove or rib area with Edilmatic squares and accessories.



2 ANCHOR CHANNELS

TOOTHED ANCHOR CHANNELS

EDILMATIC offers another type of anchor channel with a “toothing” on the tabs which thanks to the ANTI-SLIDING JOINTS allows, during the part assembling, to block the parts in the 3 orthogonal directions.

The **TOOTHED ANCHOR CHANNEL** exhibits the same shape and size of the standard anchors in the EDILMATIC product range.

On demand, a toothing is fitted on the entire tabs surface, to have an “anti-sliding” application.

The **ANTI-SLIDING JOINT** toothed as well, is perfectly fitted to the anchor channel and interlock avoid the bolt, which was previously fitted onto the channel, to slide along the channel longitudinal axis.

The Joint is fitted with 2 lateral tabs, preventing any Bolt rotation, in case the joint and coupling is no longer tight.

The **TOOTHED ANCHOR CHANNEL** is available in 2 different models, with Pegs and 1 with anti-sliding joints, according to the part capacity*.

The used materials for the toothed anchor channels are the same used for the standard channels (S280GD UNI EN 10346). The toothed channels are available in the same finishings as the standard channels.

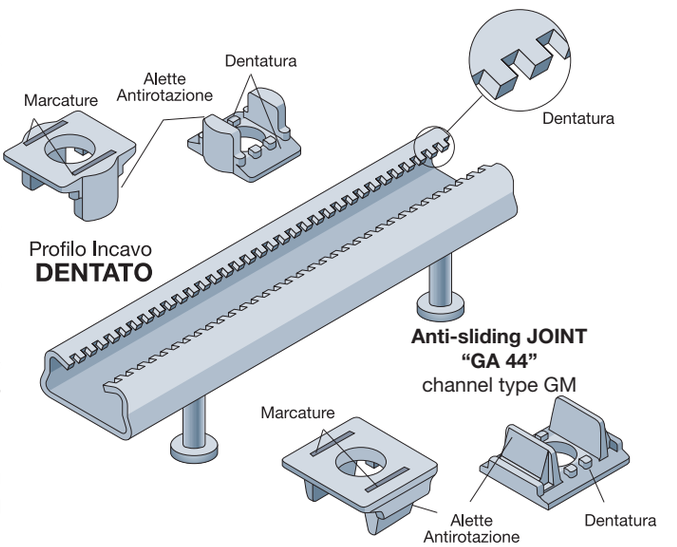
The anti-sliding joints as in S355JR steel and they are cold electrolytically galvanised
UNI EN ISO 2081

On demand, the joints can be supplied in INOX AISI 304 and/or hot-dip galvanised.

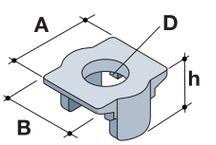
On each joint, on its upper part, the batch code is specified, including the number of casing with the production month and year and EDILMATIC ID to confirm the quality of the supplied product.

Anti-sliding JOINT “GA 34”
channel type GD

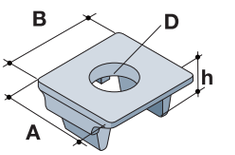
CE
EN 1090-1:2011



GIUNTO Antiscorrimento “GA 34”

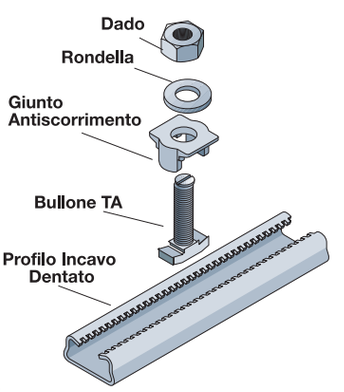


GIUNTO Antiscorrimento “GA 44”

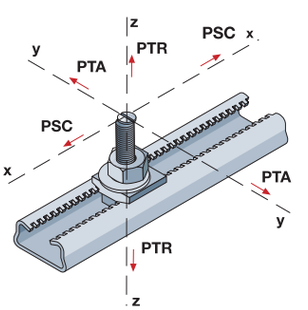


Type of TOOTHED Channel	Type Of joint	Joint sizes		
		a x b	H	D
Channel type GD (40x25x2.5)	**NTC 34**	(34x35)	18	16
Channel type GM (52x31x4)	**NTC 44**	(44x36)	20	20

Type of joints	Material	Features	Finishes
GA 34 channel type GD	**S355JR** (UNI EN 10025)	**Failure (N/mm²)= 491**	**Cold galvanising UNI EN ISO 2081**
		Yield strength (N/mm²)= 355	**STAINLESS STEEL AISI 304**
GA 44 (For type GM)		**A% (max)= 30**	**Hot-dip or sendzimir galvanising (dipping) UNI EN ISO 1461**



BLOCCAGGIO IN TUTTE LE DIREZIONI



* On demand other types of toothed anchor channels are available with different clamping.
For more information get in touch with EDILMATIC Technical department.

2 ANCHOR CHANNELS

SLIDING LOADS AND COMBINED LOADS

The Toothed anchor channels are available in different models: “GD” and “GM” with Pegs.

In case a toothed anchor channel is used for traction or cutting loads (and not sliding loads) it is absolutely necessary to use an anti-sliding Joint otherwise the reported capacities are not guaranteed.

In sliding applications with anti-sliding Joint, the toothed anchor channel capacities vary according to the type of used channel and joint.

In the table there are the admitted sliding loads, according to the suitable anti-sliding joint.

In the application with combined loads, there can be different loads at the same time.
Sliding + Traction loads
Sliding + Cutting loads
Sliding + Cutting + Traction loads

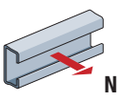
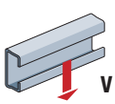
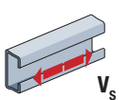
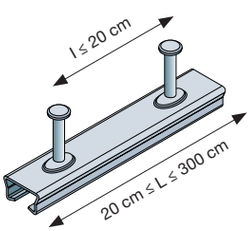
Under such conditions it is not possible to individually consider the different admitted loads, but it is important to consider the single incidence of each load component on the corresponding prescribed admitted load.

The control formula to be applied in the case of the 3 possible load components is:

$$\left(\frac{N_{Ed}}{N_{Rd}}\right)+\left(\frac{V_{Ed}}{V_{Rd}}\right)+\left(\frac{V_{S,Ed}}{V_{S,Rd}}\right) \leq 1.2 \text{ ... where}$$

N_{Rd} = Project value of the tensile strength (Value specified in the catalogue)
N_{Ed} = Project value of the jerking action
N_{Rd} = Project value of the shear strength (Value specified in the catalogue)
N_{Ed} = Project value of the shear strength
$V_{S,Rd}$ = Project value of the sliding strength (Value specified in the catalogue)
$V_{S,Ed}$ = Project value of the sliding action

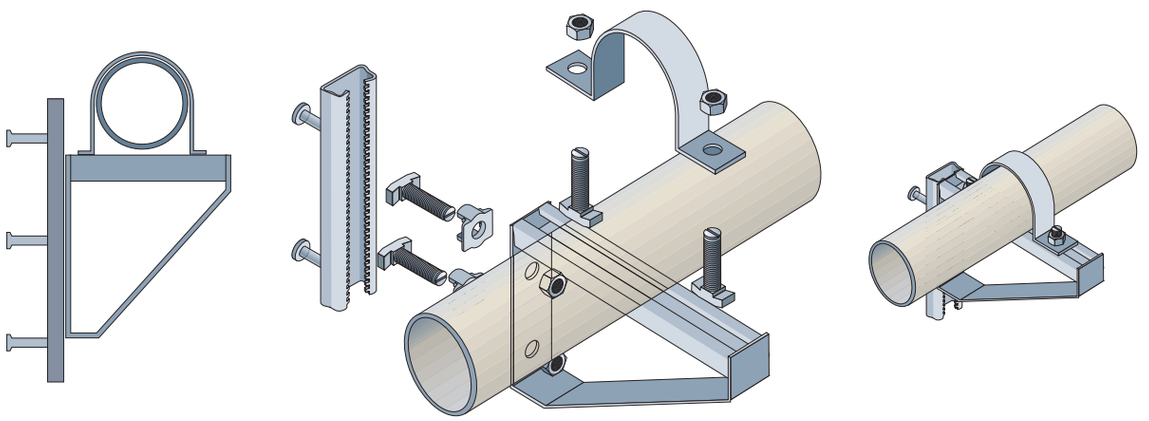
In the table there is a summary of the Admitted loads for the 2 types of Channel, in the standard used configurations relating to Single cutting, traction and sliding loads. For the other loading configuration refer to the values reported in the different pages of the catalogue.

The loading values specified in the table are to be considered only with the compulsory use of the anti-sliding joint and with CLS with RcK>25N/mm²		 N	 V	 V_S
With Pegs		**TRACTION**	**SHEAR-COMPRESSION**	**LOAD**
	**Channel type GD (40x25x2.5) Joint GA 34**	N_{Rd} **10.7 kN**	V_{Rd} **10.7 kN**	$V_{S,Rd}$ **13 kN**
	Channel type GM (52x31x4) Joint GA 44	N_{Rd} **26.6 kN**	V_{Rd} **26.6 kN**	$V_{S,Rd}$ **19 kN**

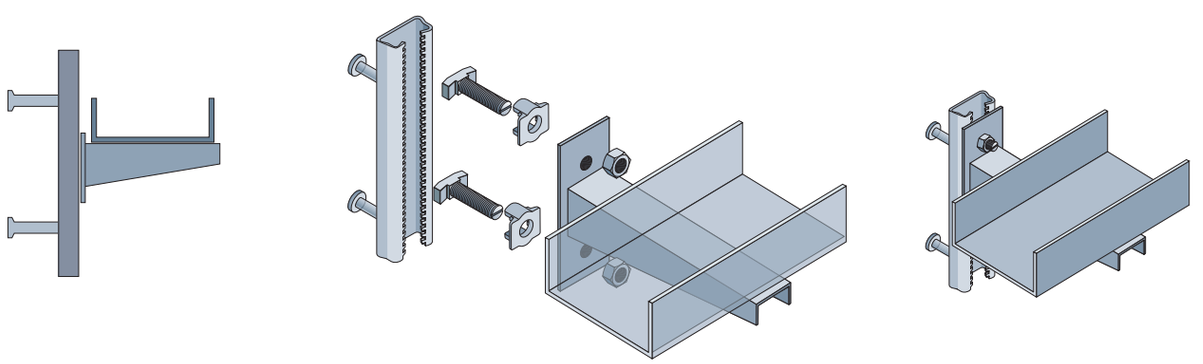
2 ANCHOR CHANNELS

EXAMPLES OF APPLICATIONS

Example:
TOOTHED CHANNELS with **ANTI-SLIDING JOINTS** to fit industrial accessories such as piping for heating systems with the use of Special EDILMATIC bolts and channels.



Example 2:
TOOTHED CHANNELS with **ANTI-SLIDING JOINTS** to fit industrial system accessories such as the cable tray and shelf for electric wiring using EDILMATIC bolts.



2 ANCHOR CHANNELS

SEISMIC JOINT GS

GENERAL INFORMATION

The design of facilities and building in seismic areas asks for tested performance anchoring to the Ultimate State Limit (USL), as to guarantee limited damages and easy recovery.

Thus EDILMATIC offers a new fitting system for horizontal and vertical fillers, adjustable for other products, forecasting the use of standard channels, of two "**Sliding joints GS**", a connection plate "**EDIL S**" and special fitting bolts and accessories.

The design principle aim at building two sliding carriages between the parts allowing the junction to freely slide.

A specific shape for the "**Joint GS**" leads to a lower deformation of the channel and a lower damage of the end CLS.

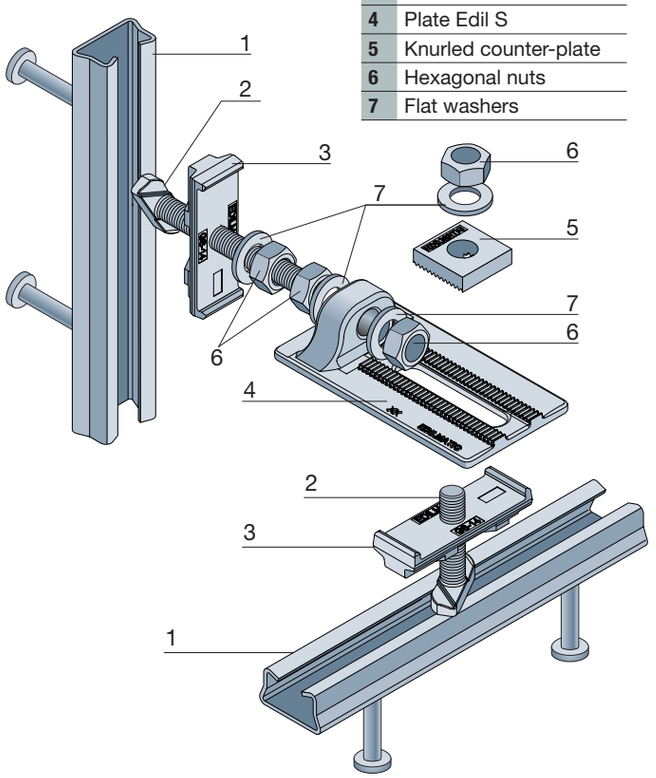
The thickness of the joint "**Edil S - Joint GS**" is only five centimetres and it allows to possibly fit it completely hidden in the available space .

Two types of joints are available, to be combined with the 4 types of channels with design strengths "N_{Rd}" between **10.7 kN** and **26.6 kN**.

On the back of Joint "**GS**", there are 2 tabs, used as a guide for the **Plate EDIL "S"**.

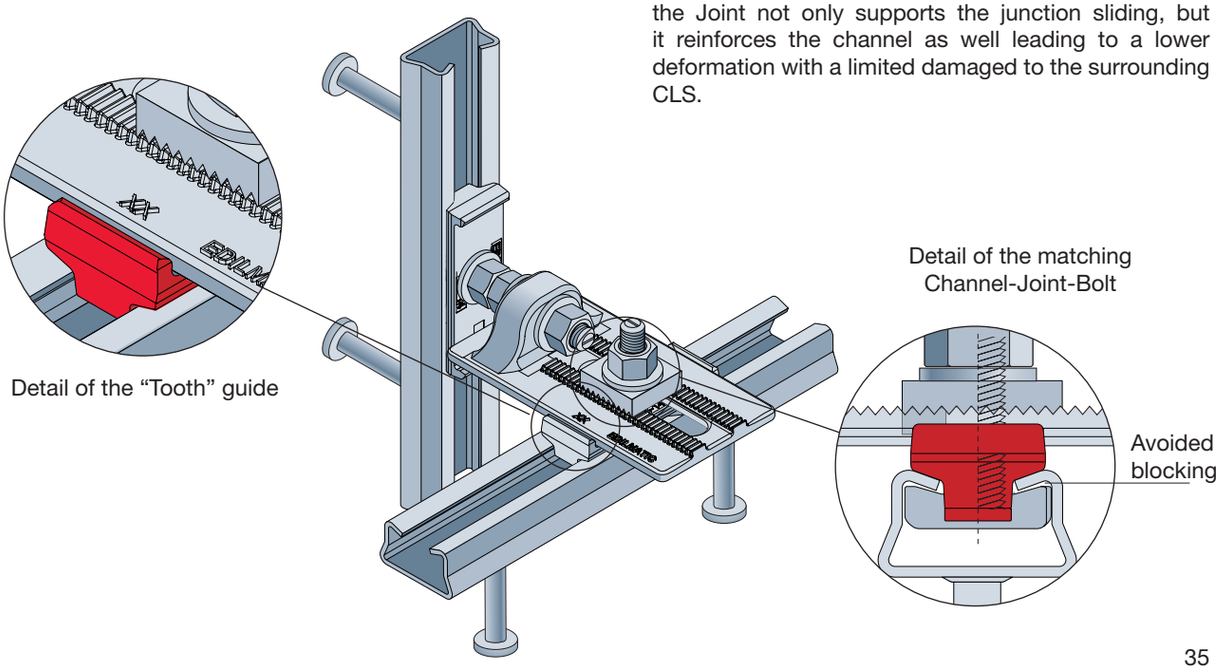
In case of induced longitudinal action depending on the earthquake, the junction can slide thanks to the specific fitted par, avoiding the Plate to rotate and leading "jamming or instability" to the system.

n.	Parts
1	Anchor channel
2	Bolts GS or TAG2
3	Joint GS
4	Plate Edil S
5	Knurled counter-plate
6	Hexagonal nuts
7	Flat washers



The special shape of the "**Joint GS**" allows to match the fitting Bolt to the channel but it avoids its blocking, allowing the bolt to freely slide inside the Channel.

In case of any action depending on the earthquake, the Joint not only supports the junction sliding, but it reinforces the channel as well leading to a lower deformation with a limited damaged to the surrounding CLS.



2 ANCHOR CHANNELS

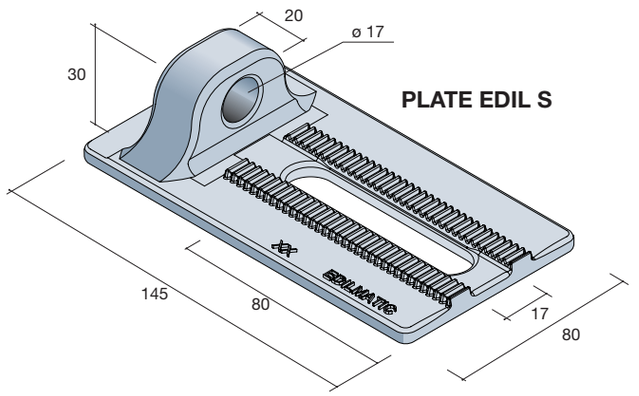
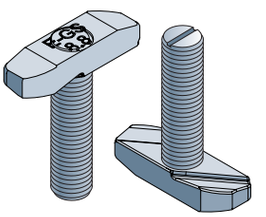


PLATE EDIL S

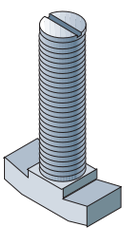
SIZES AND DIMENSIONS

To build the Edilmatic seismic junction, it is necessary to use the Plate Edil S available in a single model and the Joints GS available in 2 models, GS 14 and GS 16 according to the used Anchor Channel.

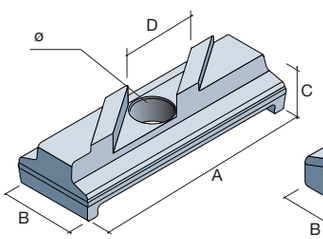
BOLTS GS14



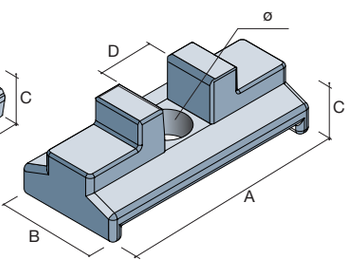
BOLTS TAG2 M16



JOINT GS14



JOINT GS16

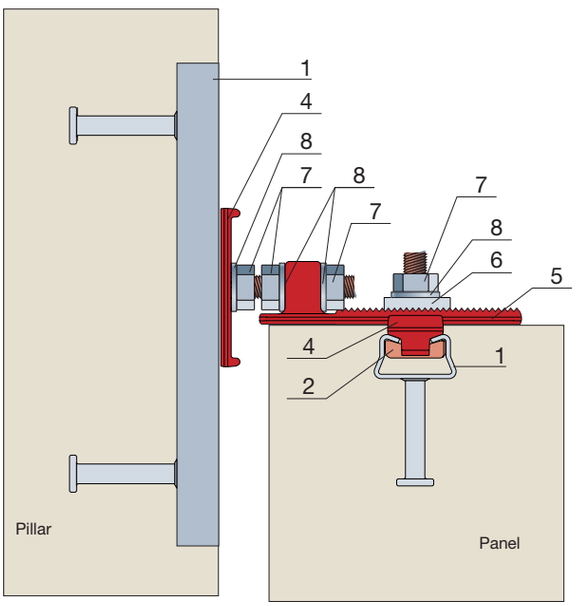


Sizes Joint GS

TYPE	A (mm)	B (mm)	C (mm)	D (mm)	And (mm)	ø (mm)
GS14	90	32	22	17	5	14.5
GS16	90	42	27	21	5	16.5

ACCESSORIES DESIGN STRENGTHS

The main design feature of the Edilmatic seismic Joint is represented by its movements to follow the vertical and parallel seismic actions in comparison to the filler level and at the same time it provides for a consistent strength to the perpendicular seismic action to the channel surface itself. As for the possible project response, variable from site to site, the seismic action and facility movements will be analysed as well as the type of channel to be used, according to the project strengths (N_{Rd}). To select the useful channel Length, consider the movements depending on the earthquake and the assembling tolerances. In the annexed table, there are the parts required to make the joint.

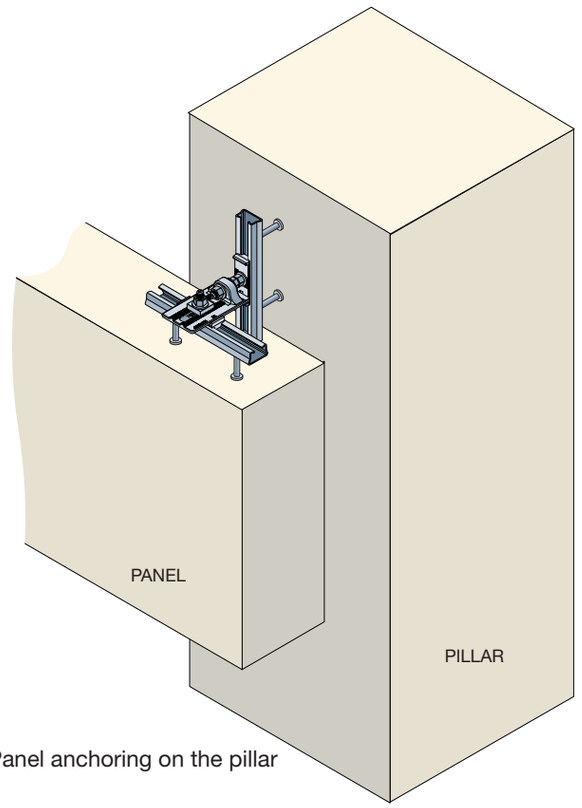


Parts			
Pos.	Quantity	Joint with Channels GS	Joint with Channels GE-GM
1	2	Anchor channel GD	Anchor channel type GE-GM
2	1	Bolt GS M14x50	Bolt GS M16x50
3	1	Bolt GS M14x80	Bolt GS M16x80
4	2	Joint GS 14	Joint GS 16
5	1	Plate Edil S	Small bracket Edil S
6	1	Knurled counter-plate 38x38	Knurled counter-plate 38x38
7	4	Standard hexagonal nuts M14	Standard hexagonal nuts M16
8	4	Flat washers d=14	Flat washers d=16

Type of anchor channel (Refer to the general catalogue Ed. 2011)	DESIGN STRENGTHS N_{Rd} (kN)
Anchor channels GD (with Pegs P1)	10.7
Anchor channels GE (with Pegs P1)	17.5
Anchor channel GM (with Pegs P1)	26.6

2 ANCHOR CHANNELS

PRESCRIPTIONS AND APPLICATIONS

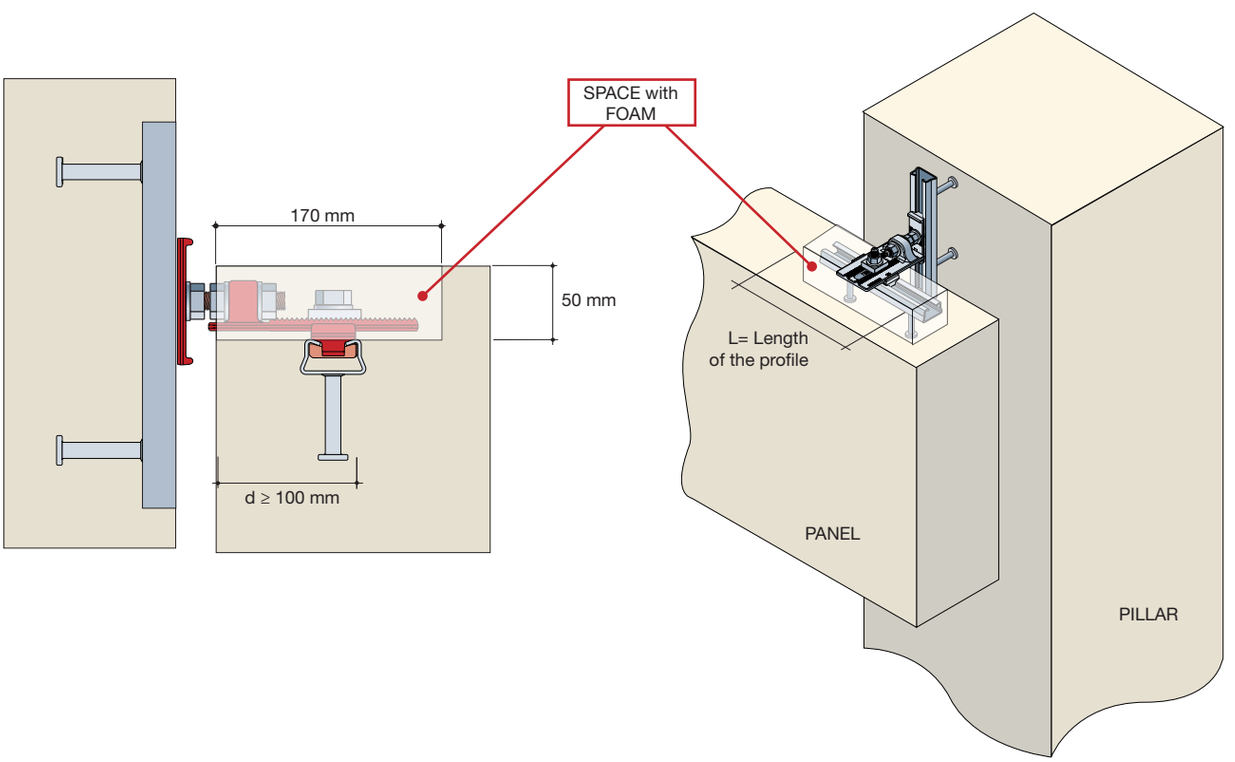


Panel anchoring on the pillar

When making the junction, it is necessary to correctly position the Panel channel. The anchor channel must be position at a specific distance from the panel border as to provide for a sufficient space of the insert while exploiting its performances at best.

The Edilmatic seismic joint is applicable to the panel extrados. If required, the joint can be “disappearing”. Thanks to the accessory reduced sizes, during the panel production, when preparing the channels, it is possible to mould a space in foam to allow the channel supporting top to be under the Panel extrados surface.

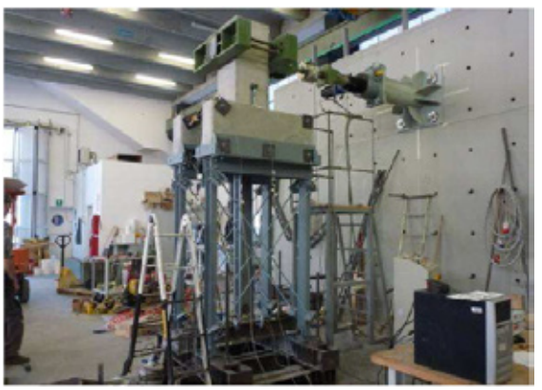
The foam sizes are 50 mm high and 170 mm wide (sizes which are more than enough to cover the “joint”), whose length is the same as the Length "L” of the used channel piece.



2 ANCHOR CHANNELS

REFERENCES AND TESTING

Notwithstanding the NTC 2018 publication, no guideline is still available on the qualification of “connection joints” for prefab units. From a legislative view point, it is not possible to provide information to the users, if not the guarantee of the connection efficacy, testing by the joints by certified laboratories to check their operation.
Thus as there is not reference legislation, since 2013 Edilmatic in co-operation with RFI, ANSALDO and COOPSETTE carried out a campaign of trials by the Material testing laboratory of the Bergamo University on different connexion parts in normal scale. Mainly the “Joint EDILS” underwent cyclical nearly-static tests on elements representing part of the pillar and two panels connected to test the system sliding capacity, simulating its behaviours in case of an earthquake.
While confirming the validity of the campaign and the good obtained results, the Edilmatic system was used by RFI to build the maintenance stations along the high speed tracks Turin-Padua.



RFI RETE FERROVIARIA ITALIANA
GRUPPO FERROVIE DELLO STATO

UNIVERSITÀ DEGLI STUDI DI BERGAMO
Centro di servizi di Ateneo LABORATORIO DI INGEGNERIA
LABORATORIO PROVE MATERIALI
Via Galvani 2, 24044 DALMINE
Tel. 035/2052347/383/339 Fax 035/2052090
P.IVA 01612800167 C.F.80004350163

Ansaldo STS
A Finmeccanica Company

coopsette

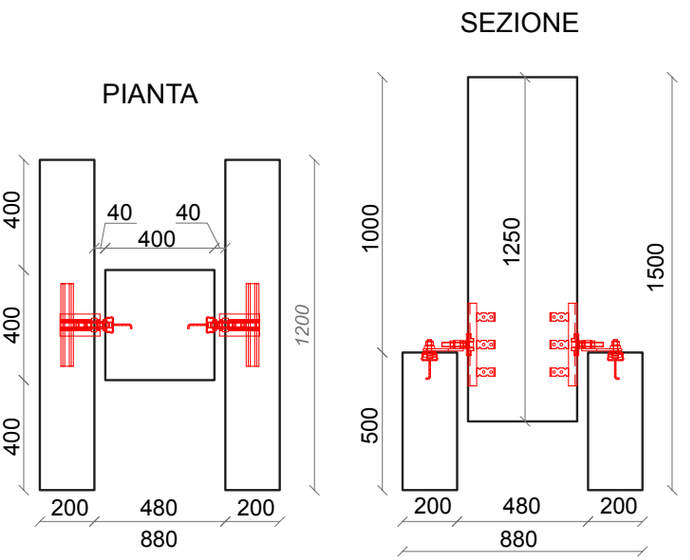
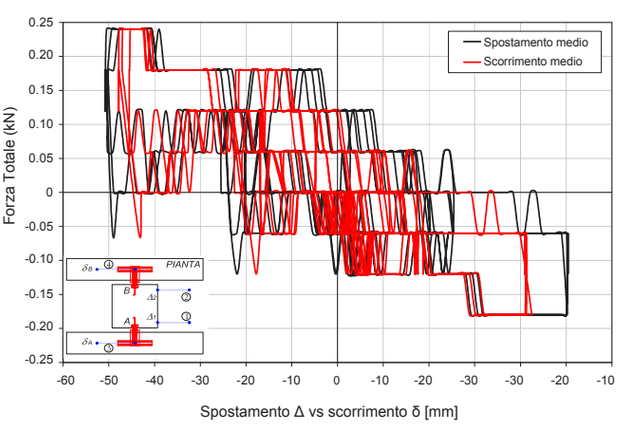


Figura 2.1 - Geometria Campioni di Prova

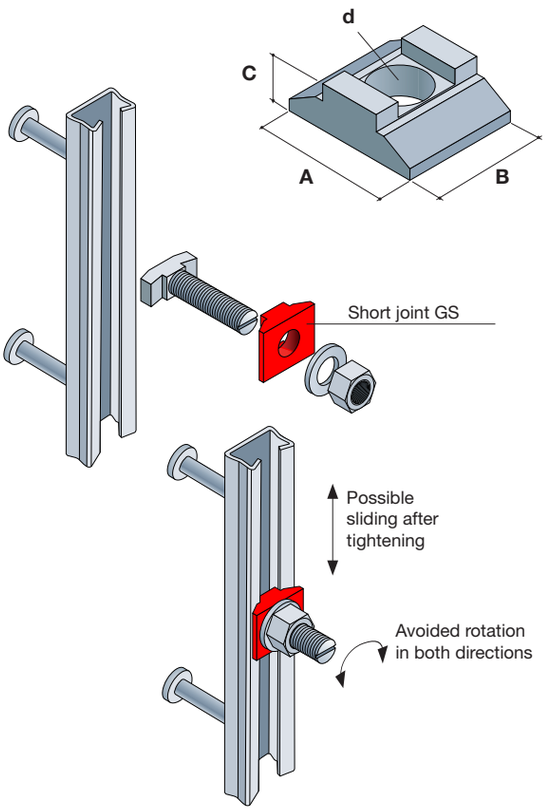
The cyclic tests reported a good behaviour of the system with an orthogonal pre-load application on the joint sliding axis and with no pre-load, with a reduced jamming, witnessed by a reduced value of the horizontal load (<4kN). The assembly configuration of the testing set was severe and prudent with an nearly-static imposed displacement. It is however possible to specify that the trial results were more than satisfactory thus finally protecting the users.
The complete report of the tests is available by the Edilmatic Technical Department.



2 ANCHOR PROFILES

JOINT GS SHORT - ANTI-ROTATION WASHER

SHORT JOINT GS



The “SHORT JOINT GS” is used for applications where the bolt transversal sliding is required inside the channel and at the same time it should provide for its safe tightening. It is prescribed in the case of the “seismic joints” where it is necessary to follow the part sliding thus providing for their fitting and anchoring (Ref. GENERAL CATALOGUE OF THE SEISMIC PRODUCTS).

2 versions are available:
For bolts TAG1-M14 and TAG2-M16.

The use of an anti-blocking thickness does not change the functional and capacity features fo the systems it is fitted to.

SIZES

as for Bolts	A (mm)	B (mm)	C (mm)	d (mm)
GS 14-Short for TAG1-M14	40	30	12	15
GS 16-Short for TAG2-M16	40	30	12	17

ANTI-ROTATION WASHERS

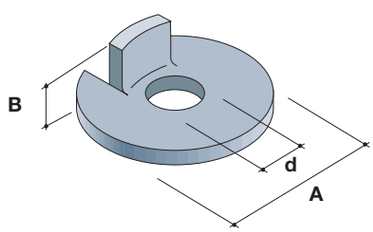
The ANTI-ROTATION WASHER is designed to provide for a higher safety in the Bolt TA tightening to the Anchor channels.

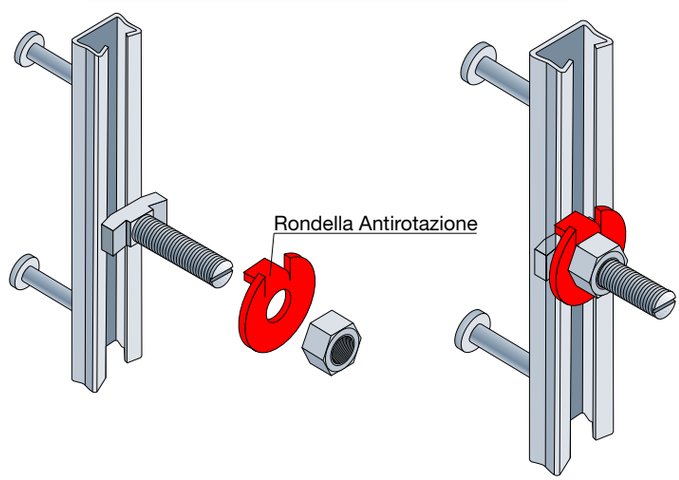
Their shape avoids in fact the bolt rotation in both directions avoiding any joint failure in case the tightening Nuts loosen.

2 versions are available:
For BOLTS TAG1-M14 and M16.

SIZES

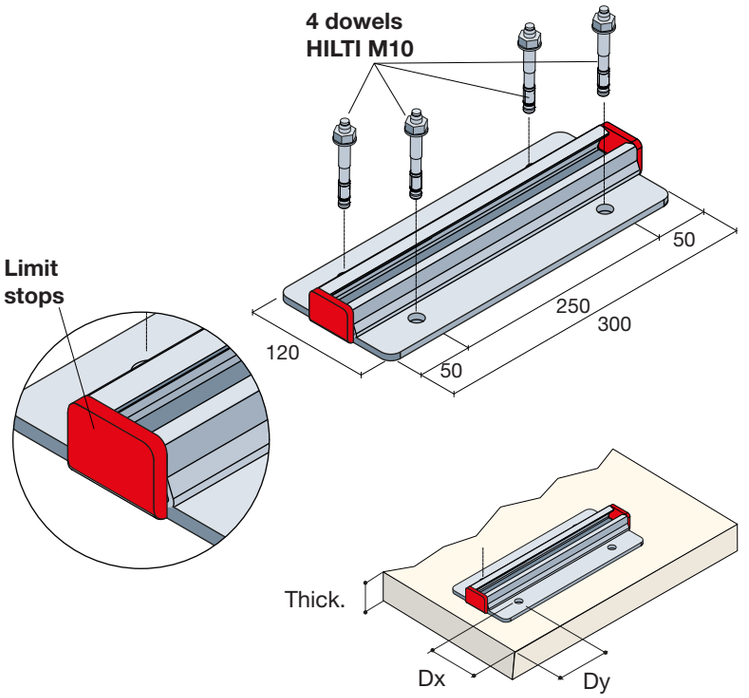
for Bolts	A (mm)	B (mm)	d (mm)
NTC 14 for TAG1-M14	45	17.0	15
NTC 16 for TAG2-M16	52	21.0	17





2 ANCHOR PROFILES

ERROR RECOVERY PLATES “PRE”



In case the anchor channels were not fitted to the prefabicated elements, an error recovery system is available. These are anchor channels fitted on shaped plates with 4 holes to be filled.

At the end of the plates there are the special “stops” to avoid the Bolts to be removed.

2 versions are available:
- Recovery plates **PREGD30**
- Recovery plates **PREGM30**

Sizes, dimensions and dowels to be used are similar for both systems.

The 2 systems are compatible with all the products in the Edilmatic range for channels **GD** and **GM**.
In the table there are the design loads on the SLU for cutting and traction movements and the prescription of the dowels.

The information on the dowels are not binding. It is possible to use other anchoring parts on conditions they are compatible with the design part information. When using the dowels (any type), comply with the manufacturer information on the maximum suggested loads, spacing, distances from borders and waiting times (chemical dowels) before tightening.

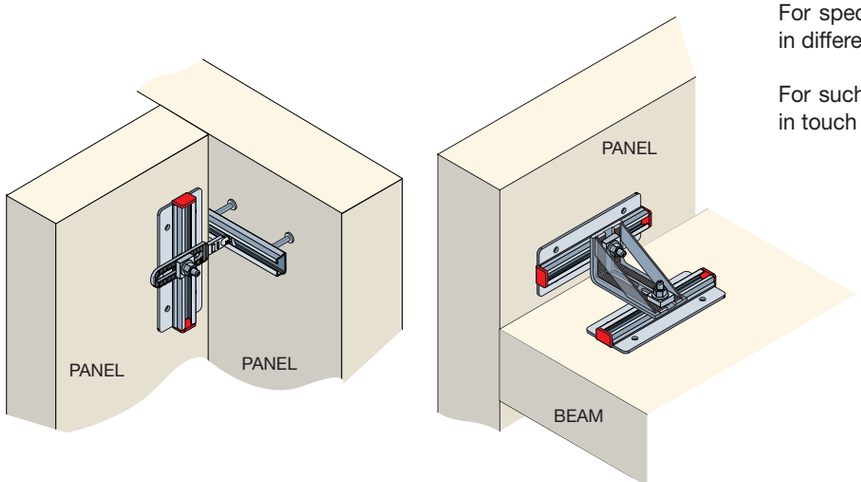
The design loads specified in the Table ($N_{r,d}$- $V_{r,d}$) apply to CLS with a minimum class RcK≥25N/mm²

Type of channel	Dowels (suggested)	Thickness min. (mm)	Dx min. (mm)	Dy min. (mm)	TRACTION (kN) N	SHEAR-COMPRESSION (kN) V
PLATE PREGD30 Channel type GD (40x25x2.5)	**HILTI HST3 hef2 M10**	120	80	80	N_{Rd} **9 kN**	V_{Rd} **9 kN**
PLATE PREGM30 Channel type GM (52x31x4)		120	110	110	N_{Rd} **10 kN**	V_{Rd} **10 kN**

They can be supplied cold-galvanised
With electrolyte galvanisation UNI EN ISO 2081
Or Hot-dip galvanised (UNI EN 1461)

For specific applications, they can be supplied in different sizes and in Stainless Steel AISI 304.

For such solutions out of standard, directly get in touch with EDILMATIC Technical Department.



2 ANCHOR PROFILES

ERROR RECOVERY PLATES “STARE”

ERROR RECOVERY PLATES “STARE” and “STARE-L”

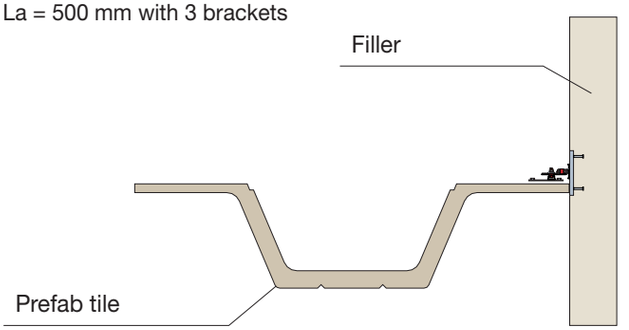
In case the anchor channels were not fitted to the prefabricated elements, thickness 5 cm and 12 cm recovery brackets are available as an alternative to Plates PRE. The fitted anchor channels on brackets with holes for the through-fittings and/or with Dowels.

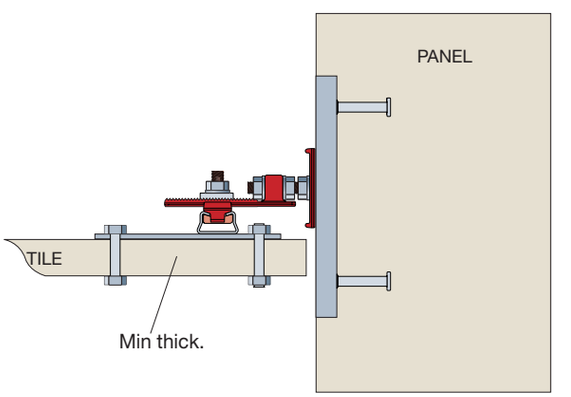
At the end of the plates there are the special “stops” to avoid the Bolts to be removed.

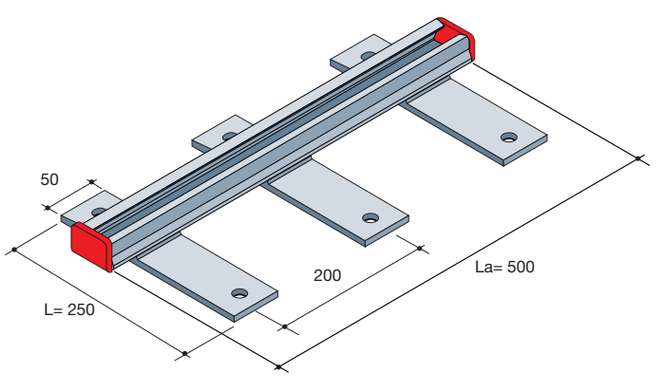
Two versions are available according to the type of part:
-Recovery brackets **STARE**
-Recovery brackets **STARE-L**

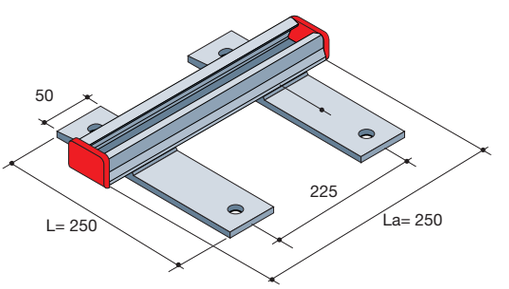
ERROR RECOVERY PLATES “STARE”

The brackets STARE are reduced in size to be used for tiles with reduced fitting spaces.
They are available for channels GD and GM and the fitting is through-holes only (threaded or screwed bars).
Two different lengths are available (La)
La = 250 mm with 3 brackets
La = 500 mm with 3 brackets



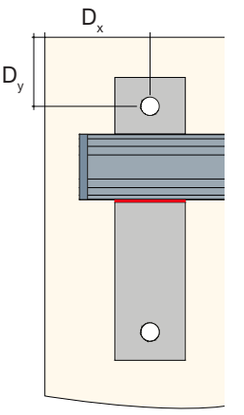






The design loads are specified in the Table ($N_{r,d}$ - $V_{r,d}$) were checked with a minimum CLS class RcK≥25N/mm²

Type of channel	L (mm)	Application With through-bars: Through-bars (suggested)	Application With through-bars: Thick-ness min. (mm)	Application Dowels: Dowels (suggested)	Application Dowels: Thick-ness min. (mm)	Dx min. (mm)	Dy min. (mm)	N: TRACTION N_{Rd} (kN)	V: SHEAR-COMPRESSION V_{Rd} (kN)
BRACKET STARE-GD Channel type GD (40x25x2.5)	**250**	**4 x M10**	50	4x HST M10	120	80	80	**N_{Rd} 10.7 kN**	**V_{Rd} 10.7 kN**
BRACKET STARE-GM Channel type GM (52x31x4)	**250**	**4 x M10**	50	4x HST M10	120	110	110	**N_{Rd} 26 kN**	**V_{Rd} 26kN**

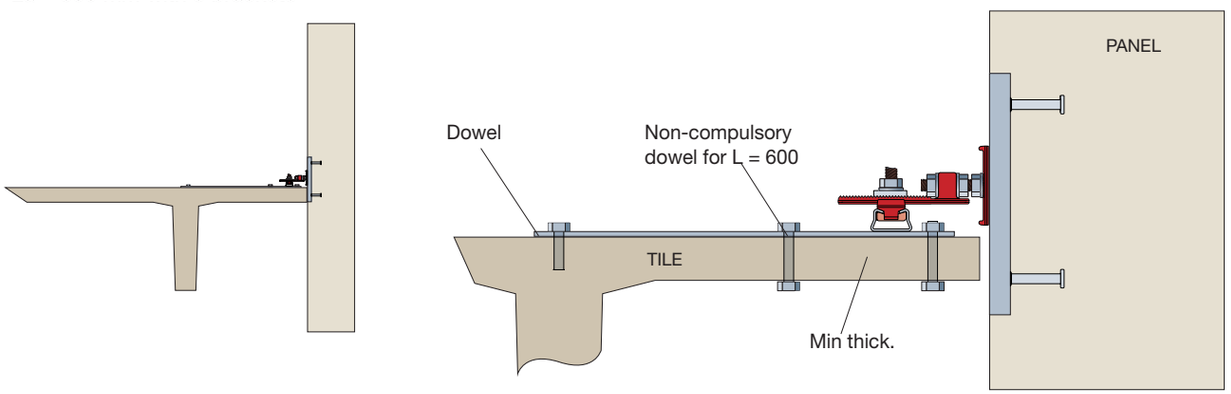


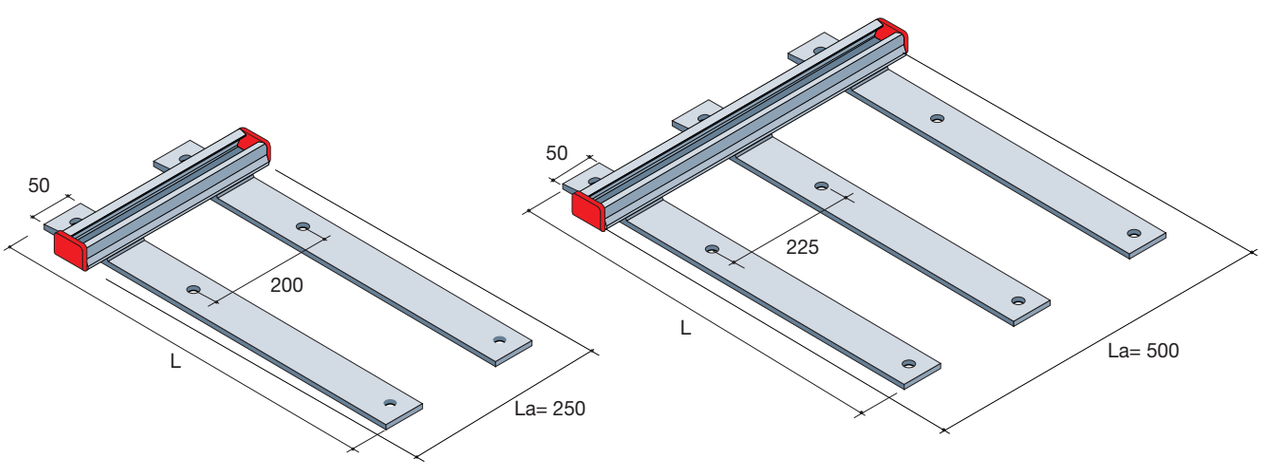
2 ANCHOR PROFILES

ERROR RECOVERY PLATES “STARE-L”

ERROR RECOVERY PLATES “STARE-L”

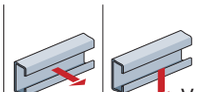
The STARE-L brackets are long to be used on "Pi-Greco” tiles in case dowels are used.
They are available for channels GD and GM and the fitting is through-holes only (threaded or screwed bars) and dowels.
The front holes are used for the through-fitting while the back holes are used for the concrete-in
at the tile stem level.
They are available for channels GD and GM and the fitting is through-holes only (threaded or screwed bars).
Two different lengths are available (La)
La = 250 mm with 2 brackets
La = 500 mm with 3 brackets

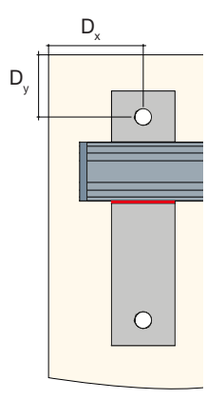




The design loads are specified in the Table ($N_{r,d}$- $V_{r,d}$) were checked with a minimum CLS class RcK≥25N/mm²

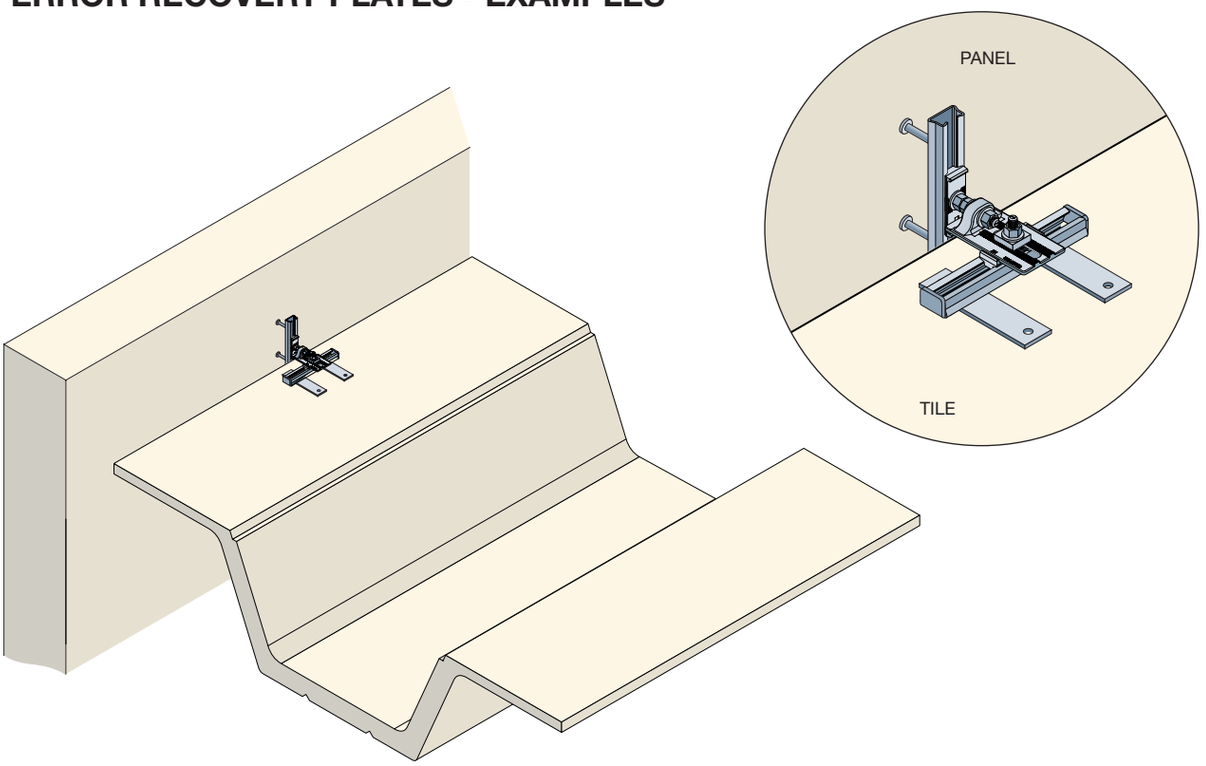
Type of channel	L (mm)	Application With through-bars: Through-bars (suggested)	Application With through-bars: Thickness min. (mm)	Application Dowels: Dowels (suggested)	Application Dowels: Thickness min. (mm)	Dx min. (mm)	Dy min. (mm)	TRACTION N_{Rd} (kN)	SHEAR-COMPRESSION V_{Rd} (kN)
BRACKET STARE-L GD Channel type GD (40x25x2.5)	300	4 x M10	50	4x HST M10	120	80	80	N_{Rd} 10.7 kN	V_{Rd} 10.7 kN
	600	6x M10		6x HST M10					
BRACKET STARE-L GM Channel type GM (52x31x4)	300	4x M10	50	4x HST M10	120	110	110	N_{Rd} 26 kN	V_{Rd} 26kN
	600	6x M10		6x HST M10					

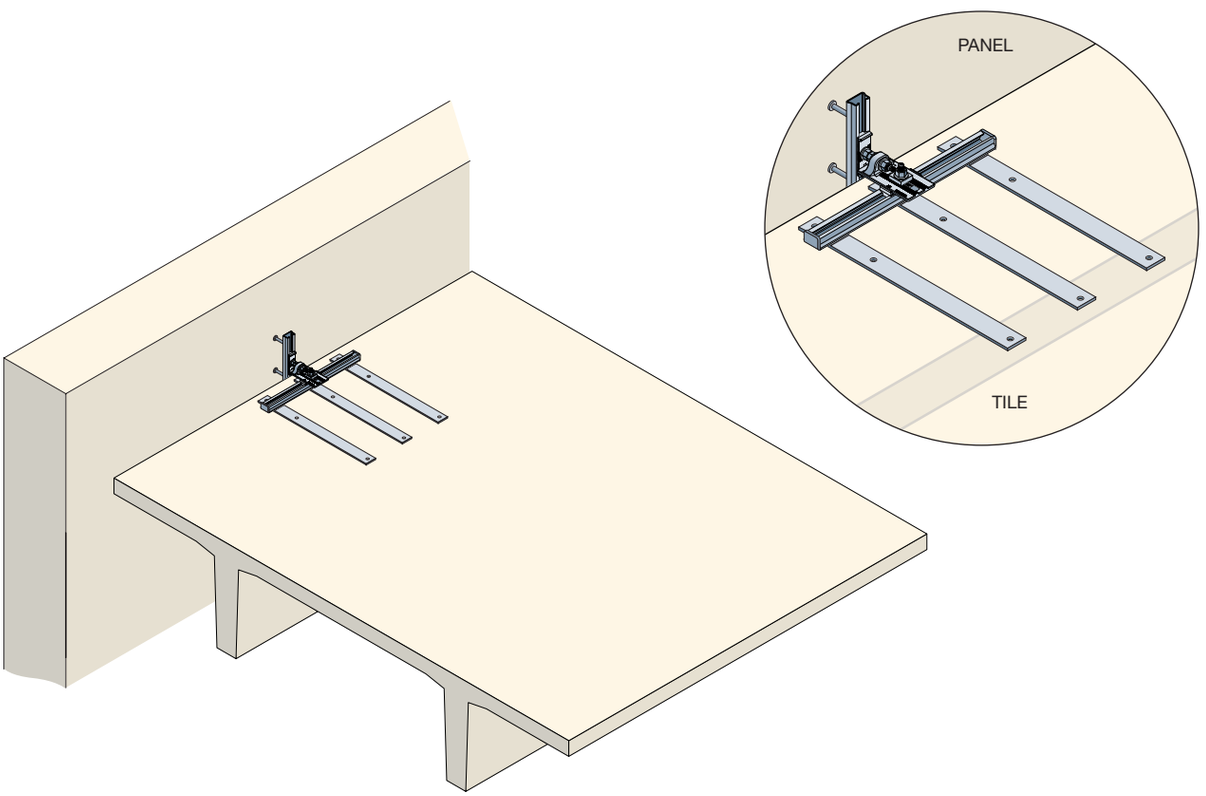




2 ANCHOR PROFILES

ERROR RECOVERY PLATES - EXAMPLES





3 BOLTS AND ACCESSORIES

ANCHOR-HEAD AND HAMMER-HEAD BOLTS

The **EDILMATIC BOLTS** were designed to be used for any type of anchor channel. Their shapes allows to optimise the driving force transfer.

They are divided in 2 categories:
HAMMER-HEAD BOLTS (TMG)
ANCHOR-HEAD BOLTS (TAG)

Their specific shape, besides the good distribution of forces on the channel tabs, allows to fit and block them in any part of the channel with simple 90° progressive rotations.

Before the final tightening with a nut and a washer, it is advisable to check the cut position in the final portion of the stem, which should be **ORTHOGONAL** to the channel supporting axis as to get the correct part assembly.

For each bolt, the tightening couples to be applied are specified to block the nuts.

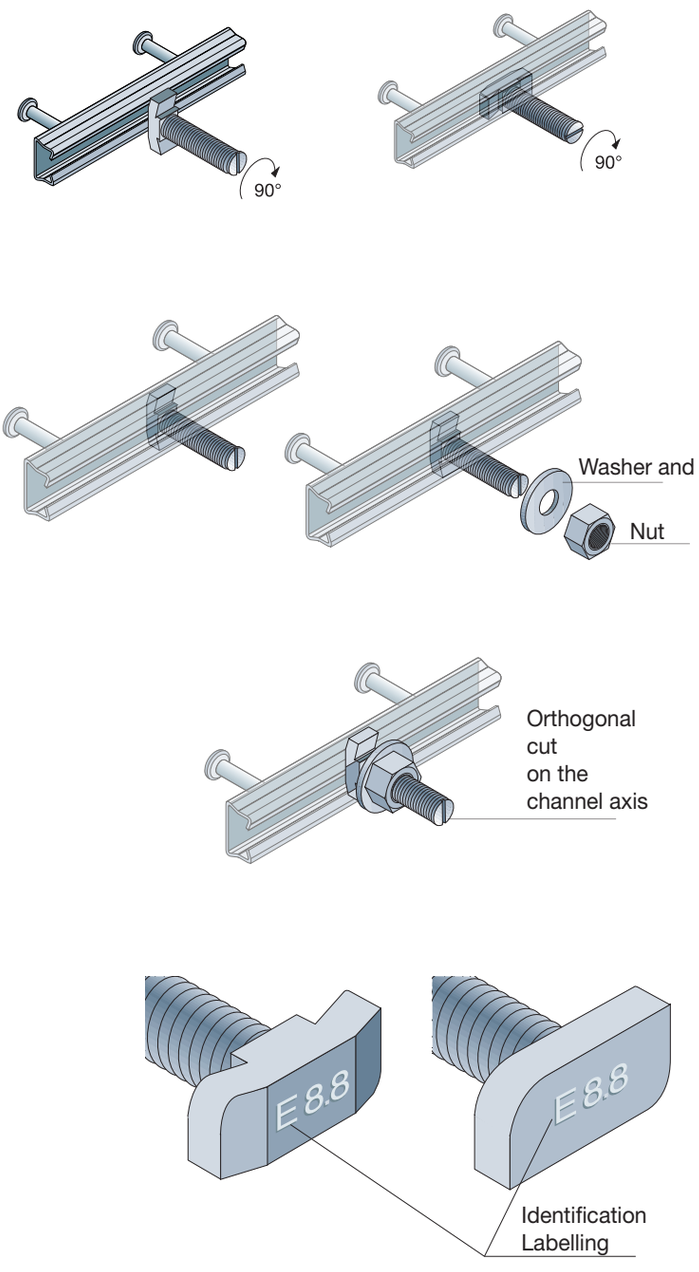
The **EDILMATIC BOLTS** are all labelled in the front of the head, with the manufacturer identification (E = Edilmatic) and the bolt strength (class 8.8 - according to UNI EN ISO 4042) as to prove the product and the enforce test quality.

For a correct product use, it is advisable to use nuts and washers supplied by Edilmatic. Many washers are available to comply with any use requirement.

The **EDILMATIC BOLTS** are made in steel C21B-30MnB3. For some type STAINLESS STEEL BOLTS are available, with a left-hand threading.

The applied loads depends on the used channel.

The **EDILMATIC BOLTS** are supplied after a cold electrolyte galvanising (UNI EN ISO 4042), packed in two cardboard boxes. Each box is identified with the type of material, the quantity and the production batch code. Inside each package there are the operating instructions for a correct product use.



TIGHTENING TORQUES

ANCHOR CHANNELS			GF	GI	GD			GE	GM
BOLTS			M12	M12	M12	M14	M16	M16	M16
Tightening torque	T_{inst}	[Nm]	15	20	30	40	40	60	60

3 BOLTS AND ACCESSORIES

MATERIALS

	Material	Regulation	Project Information: (Mpa)	
BOLTS UNI EN ISO 4018	steel cl. 8.8	UNI EN ISO 898:-1	f_{uk}	f_{yk}
			800	640
WASHERS UNI EN ISO 7089	steel UNI EN 10025	UNI EN 10025	f_{uk}	f_{yk}
			360	280
HEXAGONAL NUTS UNI EN ISO 4032	steel cl.8	UNI EN 20898-2	f_{uk}	f_{yk}
			800	640

FINISHES

Specifications	USE			
	Closed areas under dry conditions		Closed areas under wet conditions	
	Areas under dry conditions as houses offices, schools, hospitals, shops, ordinary Industrial buildings		Areas under dry conditions such as kitchens, bathrooms and in general structures where there is water.	
PRODUCTS	**Type of finish**	**Minimum finish thickness**	**Type of finish**	**Minimum finish thickness**
Bolts	Electrolyte galvanising	t ≥ 5 µm	Hot-dip or sendzimir galvanising	t ≥ 40 µm
	UNI EN ISO 4042		UNI EN ISO 10684	
Bolts and	Electrolyte galvanising	t ≥ 5 µm	Hot-dip or sendzimir galvanising	t ≥ 40 µm
	UNI EN ISO 4042		UNI EN ISO 10684	
Nuts	Electrolyte galvanising	t ≥ 5 µm	Hot-dip or sendzimir galvanising	t ≥ 40 µm
	UNI EN ISO 4042		UNI EN ISO 10684	

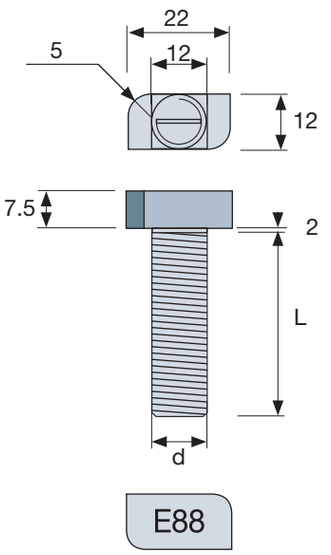
STRENGTH FEATURES

BOLTS			GD	GE	GM
Traction strength	$N_{Rk,s,s}$	[kN]	56.0	59.5	63.7
Partial safety coefficient	$g_{Ms,s}$	[-]		1.5	
Cutting strength	$V_{Rk,s,s}$		33.7	46.0	62.8
Partial safety coefficient	$g_{Ms,s}$	[-]		1.25	

3 BOLTS AND ACCESSORIES

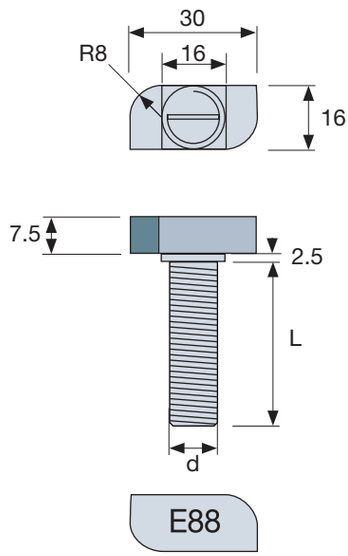
HAMMER-HEAD BOLTS

TMG1



Bolts TMG	Thread d	Length L (mm)		Anchor channel
TMG1	M12		70	GF (28x13x2,3)

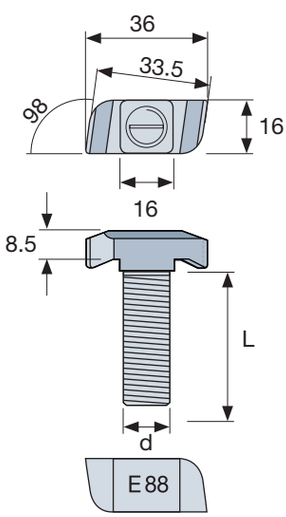
TMG2



Bolts TMG	Thread d	Length L (mm)		Anchor channel
TMG2	M12	50	70	GI (38x18x3)

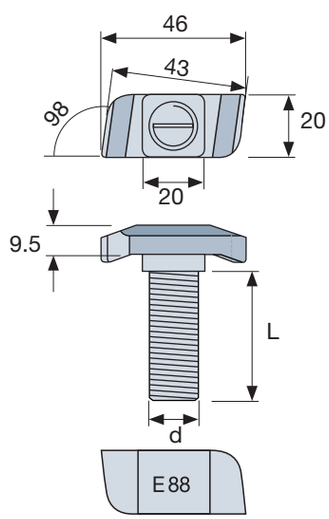
ANCHOR-HEAD BOLTS

TAG1



Bolts TAG	Thread d	Length L (mm)					Anchor channel
TAG1	M12	50	70	100	150	--	GD (40x25x2.5)
	M14	40	50	60	70	80	
		100	120	150	200	250	
	M16	50	80	100	120	--	

TAG2



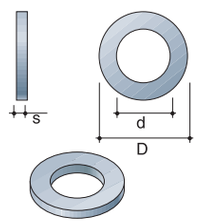
Bolts TAG	Thread d	Length L (mm)					Anchor channel
TAG2	M16	50	60	70	80	100	GE (50x30x3) GM (55x31x4)
		120	150	200	250		
	M20		60	80	100	150	GE (50x30x3) GM (55x31x4)

3 BOLTS AND ACCESSORIES

ACCESSORIES FOR BOLTS

NORMAL WASHERS

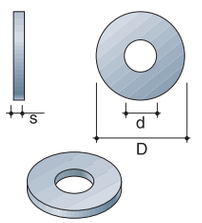
UNI EN ISO 7089
Class R40
Galvanised parts



For Bolts	D (mm)	d (mm)	s (mm)
M10	20	10.5	2
M12	24	13	2.5
M14	28	15	2.5
M16	30	17	3

BIG WASHERS

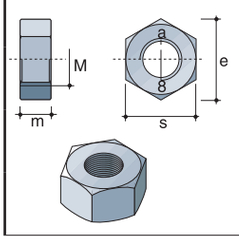
UNI EN ISO 7093
Class R40
Galvanised parts



For Bolts	D (mm)	d (mm)	s (mm)
M10	30	11	2.5
M12	36	14	3
M14	42	16	3
M16	48	18	4

MEDIUM NUTS

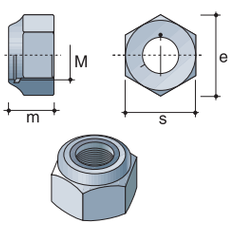
UNI EN ISO 4032
Class 8 - 6s
(According to UNI 3740/4ª)
Galvanised parts



For Bolts	s (mm)	e (mm)	m (mm)
M10	17	18.9	8
M12	19	21.1	10
M14	22	24.5	11
M16	24	26.8	13

SELF-BLOCKING NUTS

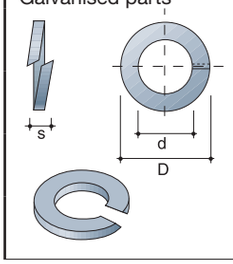
UNI 7473 - ISO 2358
Class 8 - 6s
(According to UNI 3740/4ª)
Galvanised parts



For Bolts	s (mm)	e (mm)	m (mm)
M10	17	18.9	11.5
M12	19	21.1	14
M14	22	24.5	16
M16	24	26.8	18

ELASTIC WASHERS (Grower)

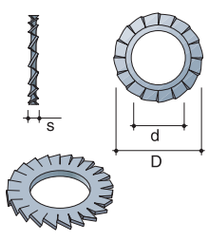
UNI 1751
DIN 127 B
Class R 150
Galvanised parts



For Bolts	D (mm)	d (mm)	s (mm)
M10	18.1	10.7	5.2
M12	21.1	12.7	5.9
M14	24.1	14.7	7.1
M16	27.4	16.7	8.3

TOOTHED WASHERS (external)

UNI 8842 A
DIN 6798 A
Class HRC 38-45
Galvanised parts

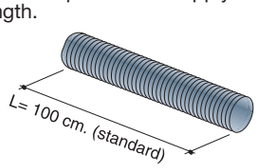


For Bolts	D (mm)	d (mm)	s (mm)
M10	18	10.5	2.7
M12	20.5	12.5	3
M14	24	14.5	3
M16	26	16.5	3.6

THREADED BARS

Metric ISO threading
DIN 975 - C40 (class 6.8)
Galvanised parts

The standard length accounts for
L = 100 cm.
On demand it is possible to supply them
in any length.



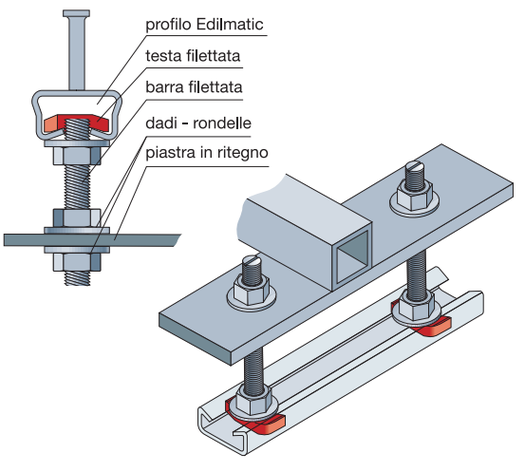
Thread (M)	length (L=cm.)	Admitted load (kN)
M10	100	21
M12	100	28
M14	100	42
M16	100	54
M18	100	74
M20	100	95
M24	100	137

The threaded bars are available on demand, class 8.8 and in B7 (ASTM A-193)

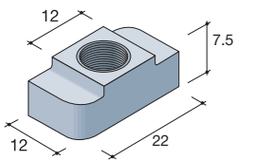
3 BOLTS AND ACCESSORIES

SPECIAL BOLTS

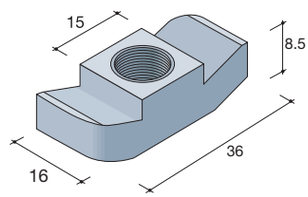
THREADED HEADS M8 - M10 - CLASS 8.8



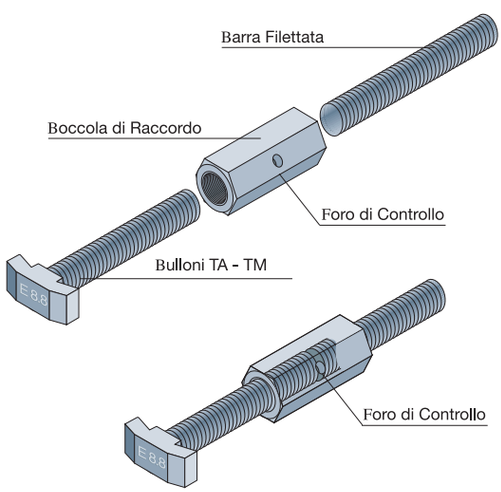
HAMMER-HEAD
ASTM M8
Steel C21B
UNI 7356-74
class 8.8
Galvanised parts

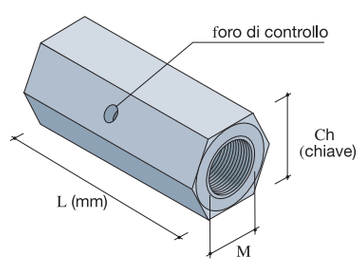


ANCHOR-HEAD
ASTM M10
Steel 30MnB3
UNI EN10083-3
class 8.8
Cold galvanising



JOINT HEXAGONAL BUSHES





Should Bolts (TA-TM) be required, longer than the maximum length specified on the catalogue, it is possible to extend them using a **Connection bush** and **Threaded bars** in the correct length to reach the required useful length

In case of applications with Anchor channels**the maximum applicable load** depends on the type of used**Channel**.

The **Applicable Load** specified on the table apply to the single part.

The parts are to be screwed up to half the Bush length.
The correct position is visible through the **Control hole** on the bush side.

Material
PS113 - CF9 SMnPb36
UNI EN 10087 - DIN 1651-88

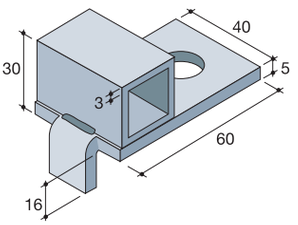
Thread (M)	L (mm)	Ch (mm)	Max load applicable (kN)
M10	30	17	13
M12	30	19	19
M14	35	22	27
M16	35	24	36

ON DEMAND the RAW MATERIAL certificates are available.

3 BOLTS AND ACCESSORIES

TUBULAR ADJUSTMENT PLATE

The **Tubular Adjustment Plate** is a simple accessory, easily to be applied, designed to support the highest possible adjustment of the anchoring distance of the concrete parts, used with Anchor channels, Bolts and standard accessories in the **Edilmatic** range.



The Tubular plate is in Steel S235JR and it is electrolytically cold galvanised (UNI EN ISO 2018).

On demand, hot-dip galvanised plates are available (UNI EN ISO 1461).

APPLICATIONS

Bolts Type	Channel Type	Maximum Applicable load (kN)
Bolts TAG1 M14	**GD**	13
Bolts TAG2 M16	**GE**	16
	GM	16

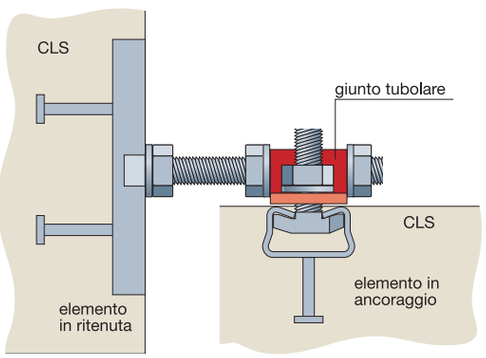
The specific shape of the Tubular plate allows under specific conditions to match different type of anchor channels.

i.e.
CHANNEL “GE” fitted with a Bolt M16
CHANNEL “GD” fitted with a Bolt M14

The used Bolts and Washers all belong to the standard EDILMATIC range.

The maximum applicable load to the system refers to the maximum load of the Channel used on the part **FITTED**.

ASSEMBLY AND ACCESSORIES



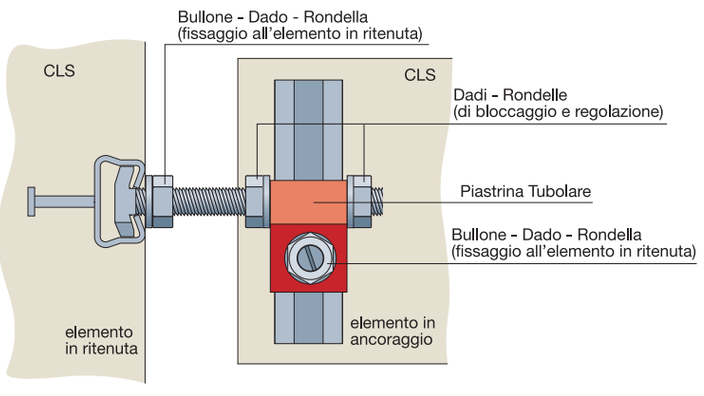
The SYSTEM essentially consists of a central part **“TUBULAR PLATE”** to be fitted (with Bolts and Nuts) to the Channel on the anchoring part and a Bolt in the correct length to be fitted to the Channel of the anchoring part and to be inserted in the joint.

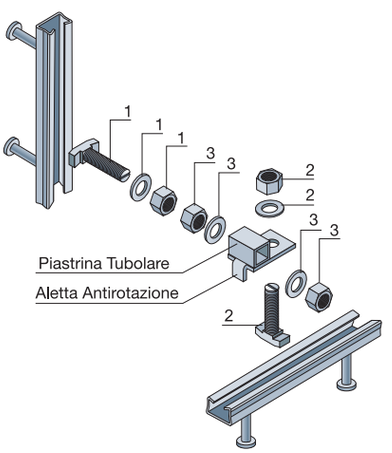
Adjusting the two adjacent Buts, the anchoring distance is adjusted.

The tab in the lower part of the **PLATE** avoids any possible rotation.

ACCESSORIES FOR ANCHORING

1 – Bolt, Nut and Washer for the anchoring part
2 – Bolt, Nut and Washer for the anchoring part
3 – Nuts and Washers to fit the Bolt (1) to the Plate.



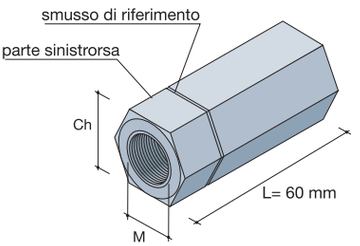


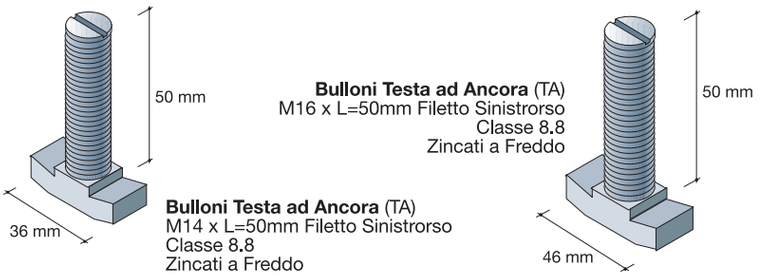
3 BOLTS AND ACCESSORIES

BUSHES - RODS

BUSH-ROD WITH RIGHT - LEFT THREAD

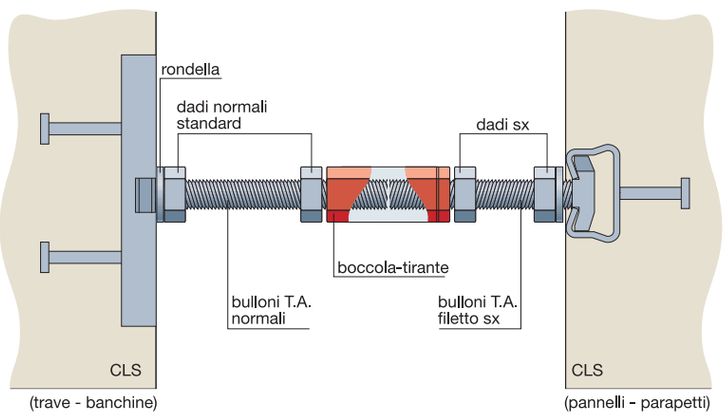
The **Bush-rod** is a simple and easy-to-use accessory, useful for distance retention of two elements in **CLS** (Beam-Panels / Banks-Banisters, etc...).





The Bush is threaded and hexagonal and exhibits partially a left-hand thread (area besides the reference blunt) and partially a right-hand thread.
In the left-hand thread, the left Bolts are to be fitted TA L = 50 mm (M14-M16).
In the opposite side, the Bolt TA with a standard length "**L**" are to be used according to the required anchoring distance.
Once the Bolts are fitted to the anchor channels in the CLS parts, the adjustment is possible through the 2 adjacent buts BUSH-ROD.

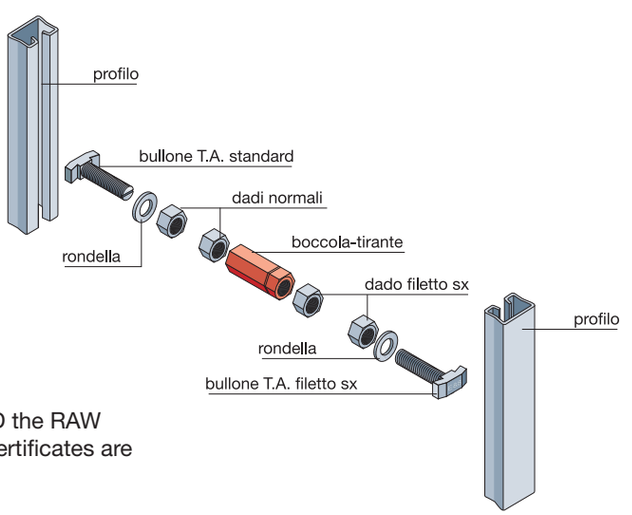
The **Bush-rod** are in special steel **PS113** (UNI EN 10083) and electrolytically galvanised (UNI EN ISO 2081).



INDICATION OF THE CAPACITIES

The maximum applicable loads on the system depends on the **USED ANCHOR CHANNEL.**

In general hereinafter annexed the loads applicable to the single part and to the used threaded bar, for any application **without an ANCHOR CHANNEL.**



Bars (M)	load applicable (kN)	Ch (mm)
M14	27	22
M16	36	24

ON DEMAND the RAW MATERIAL certificates are available.

4 RETENTION PLATES

ANCHOR-HEAD PLATES AND WITH BUSHING

CE
EN 1090-1:2011

GENERAL INFORMATION

The **EDILMATIC PLAQUES** were designed to solve the retention problems of the concrete products.
They are available in different lengths according to the anchorage distances and in different forms, according to the design loads and to the different anchor channel possibly used. The slot on the back of the Plate offers a wide regulation range of the retaining distances and the knurled coupling with the relating counter-plate avoids any sliding issue after their tightening.

On all the plates, in different positions, there are the product traceability labels, with the manufacturer identification (E = Edilmatic) and the batch code (reference to the material casting - production day and month) to guarantee their QUALITY and witnessing the enforced controls.

ANCHOR-HEAD PLAQUES (PTA)

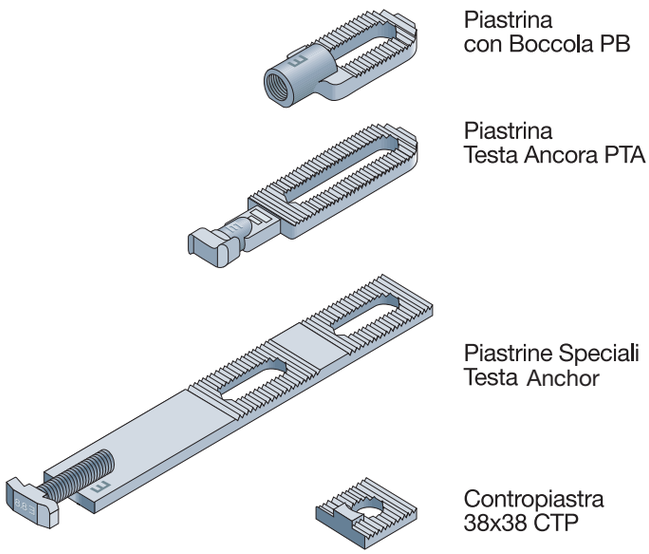
Knurled plaques made in S355J2G3 (UNI EN 10025) and cold electrolytically galvanised according to UNI EN ISO 2081.

They are used for medium-heavy channels for medium-high loads and they are available in 4 different types in different Lengths “L”:

L = 100 mm - 150 mm - 200 mm - 250 mm

The slot on the back of the Plates allows to use Bolts TA M14 or M16 according to the used Anchor Channel

To fit the plates to the anchoring part, absolutely use the Knurled counter-plated 38x38 (CTP).

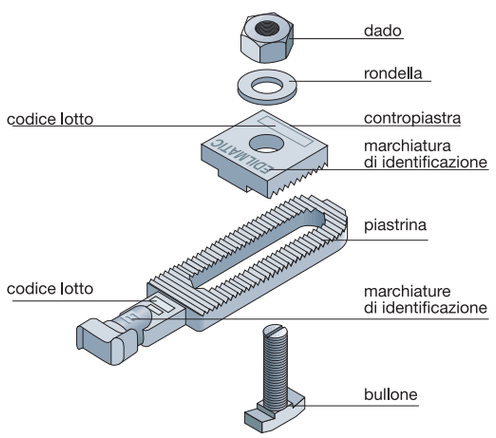


PLAQUES WITH THREADED BUSH (PB)

Knurled plaques made in CF9SMnPb36 (UNI EN 10083) and cold electrolytically galvanised according to UNI EN ISO 2081.

They are useful for applications which require a high retention distance and where a higher adjustment precision is requested.

Thanks to the coupling with bolts, available in different lengths, it is possible to reach any anchoring distance required to build the joint.



MATERIALS

Plate Type	Material	Mechanical features	Reference standards	Type of Covering
Plates TA	S355J2G3	σ rott.= 490÷630 N/mm² A%= 22	UNI EN 10025 [DIN 17100]	Electrolyte galvanising (UNI EN ISO 2081) Sp_{min}= 12 micron
Plates PB	CF9SMnPb36	σ rott.= 490÷630 N/mm² A%= 22	UNI EN 10087 [DIN 1651]	

The TECHNICAL DEPARTMENT is available to provide ON DEMAND the testing certificates of RAW MATERIALS and the PRODUCT. The certificates are available for each bought batch.

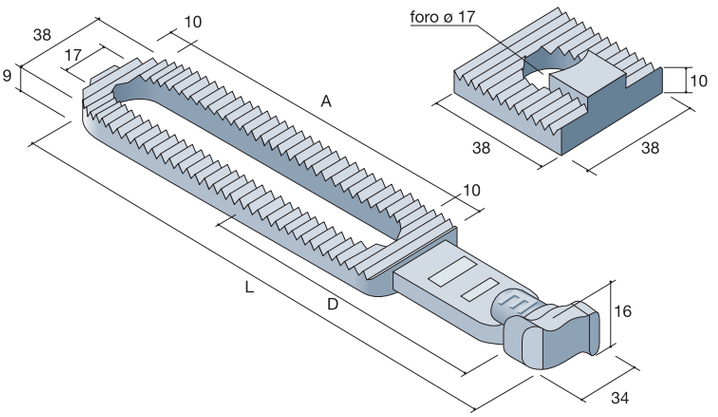
4 RETENTION PLATES

ANCHOR HEAD PLAQUES FOR CHANNEL GD

CE
EN 1090-1:2011

DIMENSIONS

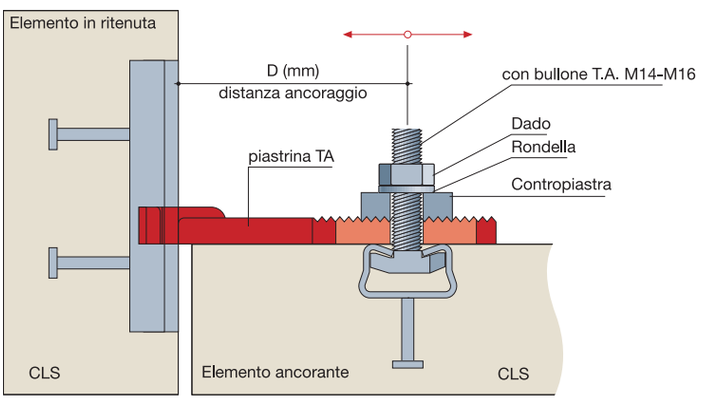
Type of plate	Dimension D	Dimension A
L = 100 mm	50	50
l ≤ 150 mm	85	90
l ≤ 200 mm	125	120
l ≤ 250 mm	170	120



ADJUSTMENT DIMENSIONS

TABLE 1
Retention and adjustment distances

	Type of plate L	Anchoring distance D (mm)		
		D (mm)	D Min. (mm)	D Max. (mm)
With bolts TAG1 - TAG2	L= 100 mm	50	32	68
	L= 150 mm	85	48	120
	L= 200 mm	125	68	170
	L= 250 mm	170	118	220



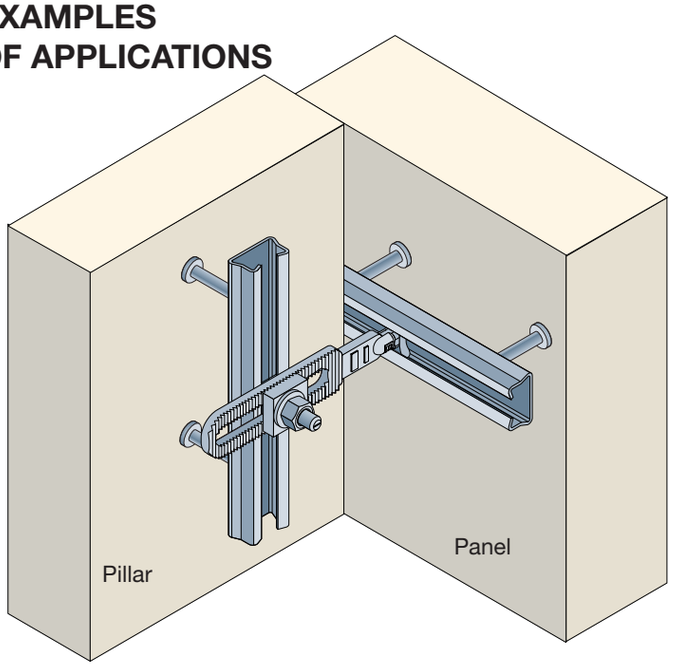
The **DIMENSION D** is the mean distance which can be reached with the different types of Plaques, calculated from the channel center of the ANCHORING part to the RETEINED element.
D max. and D min. are the minimum and maximum distances which can be reached using the Plaques slots.

TABLE 2
Combinations and used loads

	Anchoring part Used channel	Anchoring part Used channel	Load of the project N_{RD} (kN)
Bolts TAG1	Type GD	Type GD	10.7

The maximum load applicable to the system depends on the tensile max load of the profile used in the retained element.

EXAMPLES OF APPLICATIONS



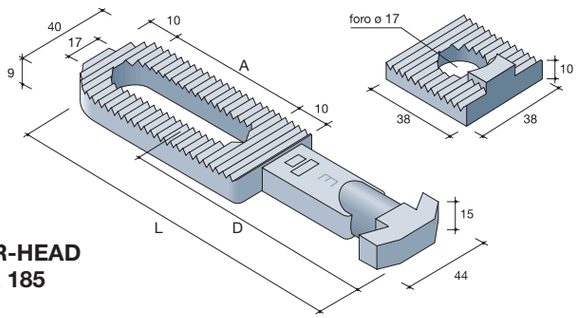
4 RETENTION PLATES

ANCHOR HEAD PLAQUES FOR CHANNEL GE AND GM

CE
EN 1090-1:2011

DIMENSIONS

Type of plate	Dimension D	Dimension A
L = 185 mm	110	100
L = 200 mm	130	100
L = 250 mm	170	120
L = 300 mm	220	120

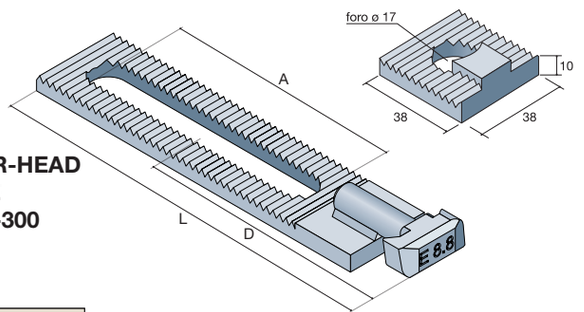


ANCHOR-HEAD PLAQUE 185

ASSEMBLY INFORMATION

TABLE 1
Anchoring and adjustment distances

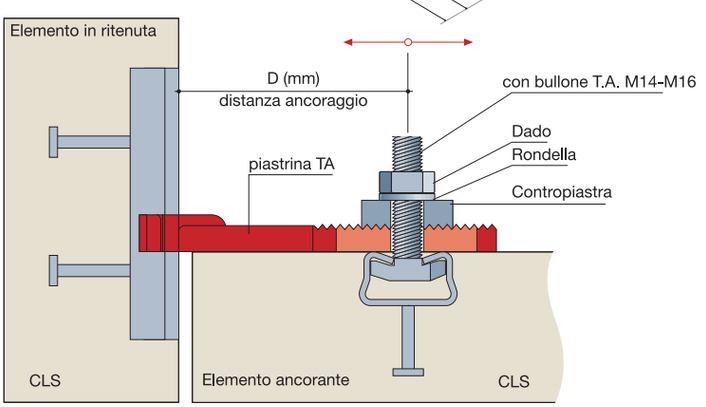
	Type of plate L	Anchoring distance D (mm)		
		D (mm)	D Min. (mm)	D Max. (mm)
With bolts TAG2	L = 185 mm	110	70	150
	L =200 mm	130	80	170
	L = 250 mm	170	110	220
	L = 300 mm	220	160	270



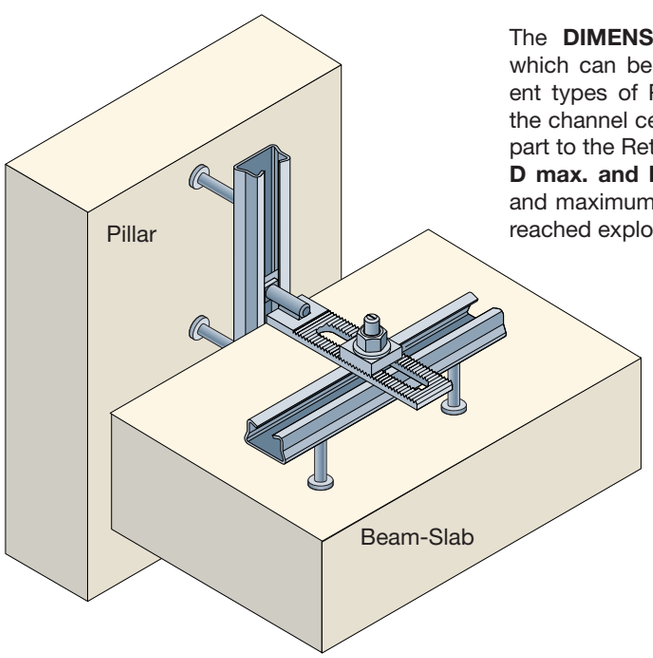
ANCHOR-HEAD PLAQUE 200-250-300

TABLE 2
Combinations and used loads

	Anchoring part Used channel	Anchoring part Used channel	Load of the project N_{RD} (kN)
With bolts TAG2	Type GE	Type GE	17.5
	Type GM	Type GM	26.6



EXAMPLES OF APPLICATIONS



The **DIMENSION D** is the distance which can be reached with the different types of Plaques, calculated from the channel center of the ANCHORING part to the Retained part.
D max. and D min. are the minimum and maximum distances which can be reached exploiting the Plaques slot.

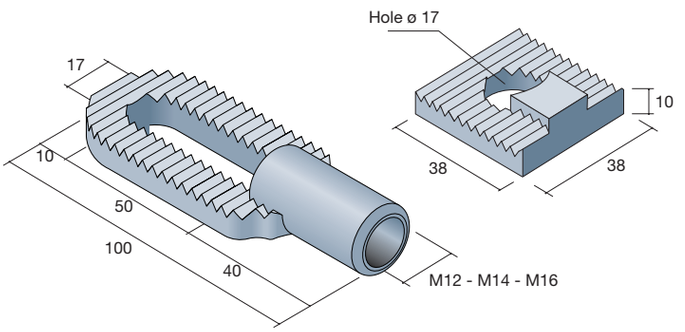
4 RETENTION PLATES

PLAQUE WITH THREADED BUSH PB (M12-M14-M16)

CE
EN 1090-1:2011

The Edilmatic plaques with bush were designed to be fitted with Bolts TA and TM (M12-M14-M16) for any application where a high anchoring distance and a higher adjustment precision are required, but also in all the cases when it is necessary to recover possible Channel positioning errors. When using the available bolts in the different lengths, it is possible to reach any distance.

The bolt must be screwed for at least 20 mm in the plaque bush and the following tightening in the retained element profile has to be carried out with the required Nuts and Washers.



ASSEMBLY DATA

According to the retention distance “D”, we calculate the Length "L” of the bolt which has to be coupled.
The Bolt must be screwed for at least **20 mm in the bush, as a consequence we obtain the value “A” = 40 mm.**
The bolt Length “**L**” depends on the following formula:

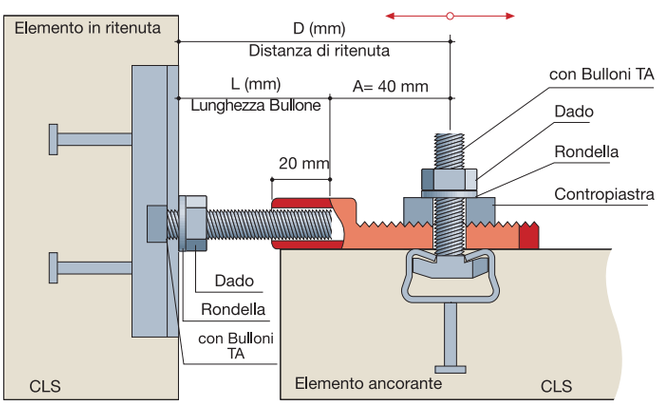
L = D – 40 mm ..... where

L= Length of the Bolt
D= Anchoring distance

i.e. Anchoring distance = 100 mm

Length **L** of the bolt = **D-40 mm** = 100 – 40 = 60

(Length of the bolt L= 60 mm)



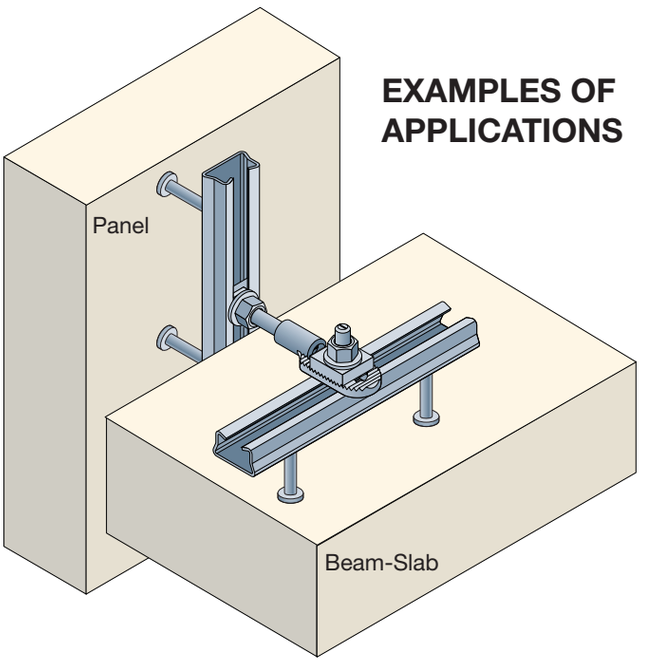
The **Distance D** is the distance which can be reached with the different types of Bolts, calculated from the channel center of the ANCHORING part to the RETAINED part. Through the slot (50 mm) on the PLAQUE the distance can vary [(D ±**18** mm)].
Through the fitted bolt before its tightening, it is possible to make other millimetre adjustments to get the best possible retention.

TABLE 2
Combinations and used loads

	Anchoring part Used channel	Anchoring part Used channel	Load of the project N_{RD} (kN)
Bolts TAG1	Type GD	Type GD	10.7
Bolts TAG2	Type GE	Type GE	17.5
	Type GM	Type GM	26.6

The maximum applicable load to the system refers to the maximum load of the Channel used on the part FITTED.

EXAMPLES OF APPLICATIONS



5 SMALL BRACKETS - ANGLE BRACKETS

SQUARES WITHOUT REINFORCEMENTS

CE
EN 1090-1:2011

GENERAL INFORMATION

The **Edilmatic Knurled SQUARES,** in the standard versions, **WITHOUT REINFORCEMENTS**, are available in 5 different types, in different shapes and dimensions, to better adjust them in case of concrete part anchoring and connection.

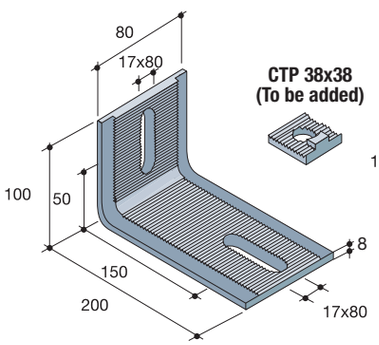
When ordered, they are to be identified as "**SR**" following the type of bracket. Example:
The square **EDIL 1-SR** is **with no REINFORCEMENTS**.

To correctly fit the squares, it is advisable to use Knurled counter-plates (CTP 38x38 to be separately ordered) .

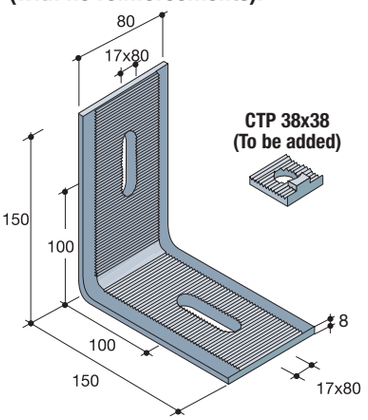
They are supplied with cold electrolyte galvanising (UNI EN ISO 2081) and on demand hot-dip galvanised (UNI EN ISO 1461)

On each square there is the product traceability with the manufacturer identification (**EDILMATIC**), the lot code (material casting number, part production month and year).

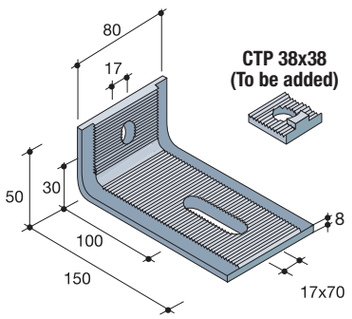
Square EDIL 1-SR (with no reinforcements).



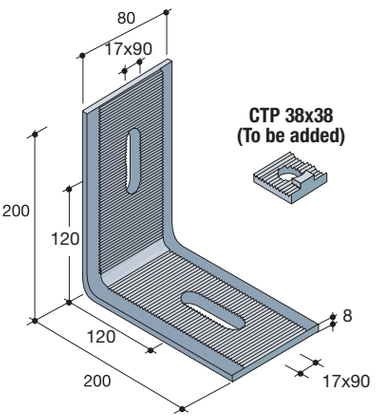
Square EDIL 2-SR (with no reinforcements).



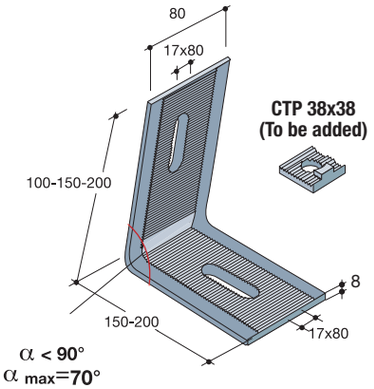
Square EDIL 3-SR (with no reinforcements).



Square EDIL 4-SR (with no reinforcements).



Bracket EDIL 5-SR Special (Without reinforcements)



On demand special **squares EDIL 5** can be supplied with bending angle α **< 90°** up to a maximum α_{max}**=70°**

The configuration of the square EDIL 5 can be obtained with squares **EDIL 1 - 2 - 4**

Prescriptions and capacities are similar to the standard products.

CAPACITIES

The **squares** with no side supports have a maximum capacity of 4 kN both with anchor channels and with fitting with dowels.

CAPACITIES WITH ANCHOR CHANNELS

Type of square	Load N_{RD}
WITHOUT reinforcements)	4.0 kN

INFORMATION ON MATERIALS

Material	Characteristics	Type of Coating
S355J0 UNI EN 10025	σ rott. min.= 490Mpa $A_{\%}$= 22	Cold Electrolyte galvanising (UNI EN ISO 2081)

The TECHNICAL DEPARTMENT is available to provide ON DEMAND the testing certificates of RAW MATERIALS and the PRODUCT.

5 SMALL BRACKETS - ANGLE BRACKETS

SQUARES WITH REINFORCEMENTS

CE
EN 1090-1:2011

GENERAL INFORMATION

The **Edilmatic Knurled SQUARES,** in the standard versions, **with REINFORCEMENTS**, are available in 5 different types, in different shapes and dimensions, to better adjust them in case of concrete part anchoring and connection.

When ordered, they are to be identified as "**R**" following the type of square. Example:

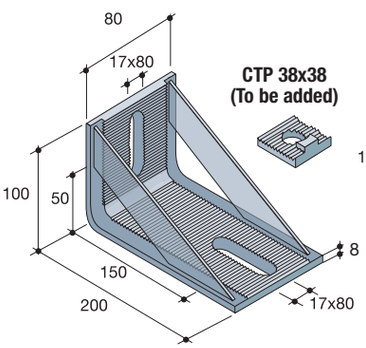
The Square **EDIL 1-R** is **with REINFORCEMENTS**.

To correctly fit the squares, it is advisable to use Knurled counter-plates (CTP 38x38 to be separately ordered) .

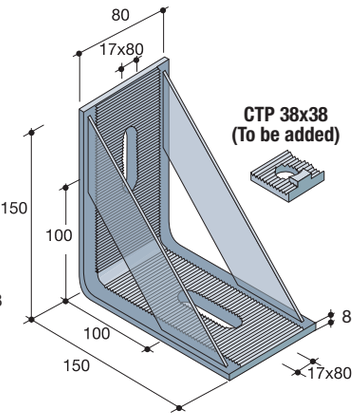
They are supplied with cold electrolyte galvanising (UNI EN ISO 2081) and on demand hot-dip galvanised (UNI EN ISO 1461)

On each square there is the product traceability with the manufacturer identification (**EDILMATIC**), the lot code (material casting number, part production month and year).

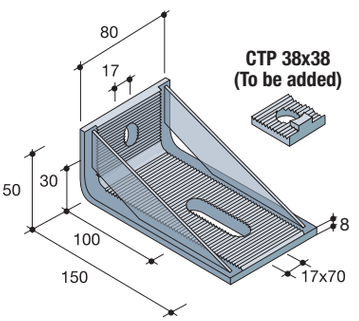
Square EDIL 1-R (with reinforcements).



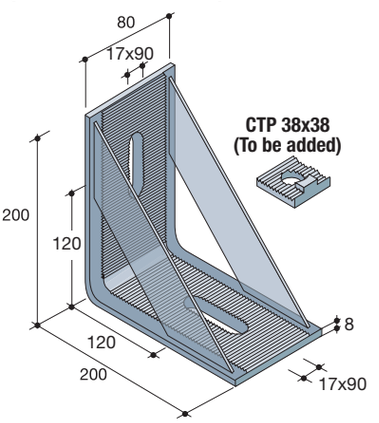
Square EDIL 2-R (with reinforcements).



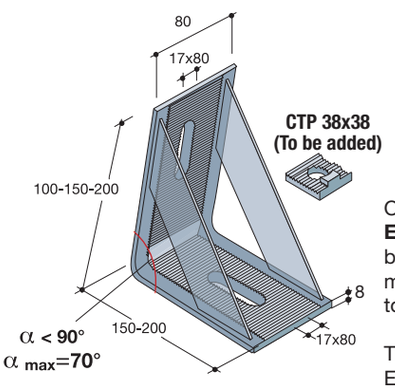
Square EDIL 3-R (with reinforcements).



Square EDIL 4-R (with reinforcements).



Square EDIL 5-R Special (With reinforcements)



On demand special **squares EDIL 5** can be supplied with bending angle α **< 90°** up to a maximum α_{max}**=70°**(according to the customer requirements).

The configuration of the square EDIL 5 can be obtained with squares **EDIL 1 - 2 - 4** with or without reinforcements.

Prescriptions and capacities are similar to the standard products.

CAPACITIES

The **SQUARES** have variable capacities depending on the form and on the anchorage used.

In the application with ANCHOR CHANNELS, the maximum load to be applied depends on the used channel. For more information get in touch with Edilmatic Technical Department.

Capacities with ANCHOR CHANNELS

Type of Square	Design load N_{RD}
WITH reinforcements	According to the channel

INFORMATION ON MATERIALS

Material	Mechanical	Type Covering
S355J0 UNI EN 10025	σ rott. min.= 490Mpa $A_{\%}$= 22	Cold Electrolyte galvanising (UNI EN ISO 2081)

The TECHNICAL DEPARTMENT is available to provide ON DEMAND the testing certificates of RAW MATERIALS and the PRODUCT.

5 SMALL BRACKETS - ANGLE BRACKETS

STANDARD SQUARES

EN 1090-1:2011

GENERAL INFORMATION

The range of Edilmatic squares/corner pieces was expanded with 4 other knurled squares in different sizes to offer higher assembling tolerance to the users.

Such new squares are identified with the acronym “SQUAD” and they are obtained from a processing on a machine tool.

They are available WITH REINFORCEMENTS (even on a single side only) and WITHOUT REINFORCEMENTS.

SQUAD..... = with lateral reinforcements
SQUAD.....SR = without lateral reinforcements

In the knurled part it is compulsory to use the knurled counter-plated (CTP 38x38 to be separately ordered).

They are supplied with a cold electrolyte galvanisation (UNI EN ISO 2081) and on demand with a hot-dip galvanisation. do (UNI EN ISO 1461).

CAPACITIES

The SQUADs exhibit variable capacities according to the type of used anchorage.

In the application with ANCHOR CHANNELS, the maximum load to be applied depends on the used channel.

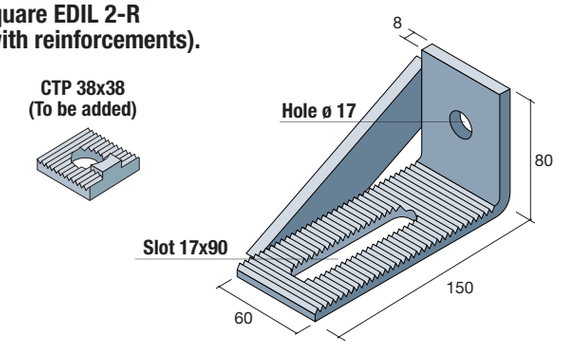
Capacities with ANCHOR CHANNELS

Type of Square	Load
WITH reinforcements	According to the channel
WITHOUT reinforcements	4.0 kN

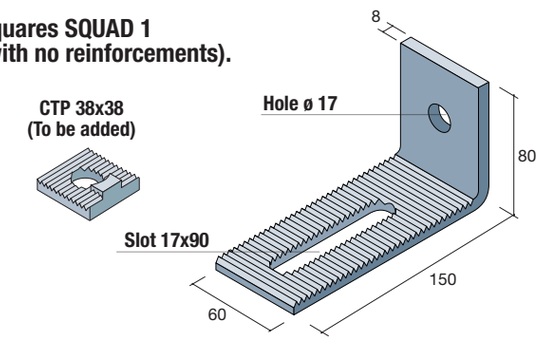
INFORMATION ON MATERIALS

Material	Characteristics	Type of coating
S355J0 UNI EN 10025	σ rott. min.= 490Mpa $A_{\%}$= 22	Cold Electrolyte galvanising (UNI EN ISO 2081)

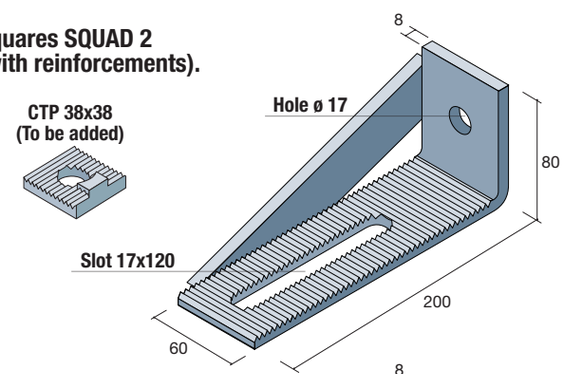
Square EDIL 2-R (with reinforcements).



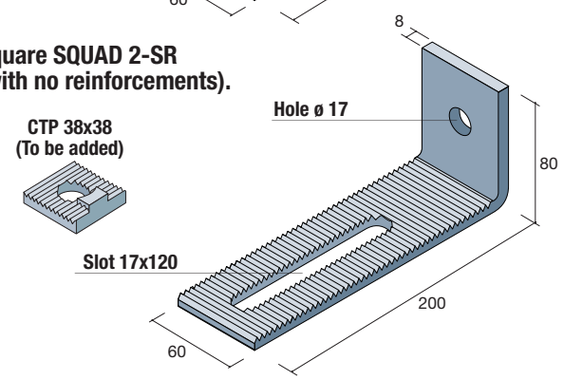
Squares SQUAD 1 (with no reinforcements).



Squares SQUAD 2 (with reinforcements).



Square SQUAD 2-SR (with no reinforcements).



NOTES The hereinbefore described**SQUAD** corner pieces are available in stock. It is possible to supply special SQUADs on demand with defined sizes by the user.

5 SMALL BRACKETS - ANGLE BRACKETS

SPECIAL CORNER PIECES AND PLAQUES

CE
EN 1090-1:2011

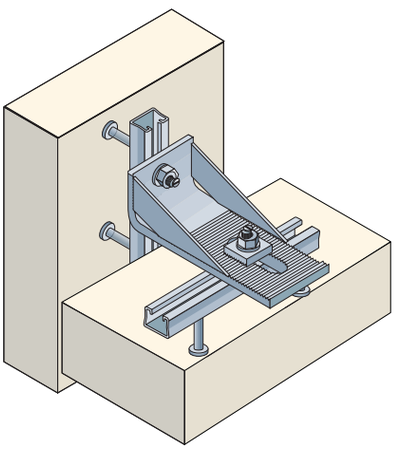
Besides the standard squares and plaques, on demand special **CORNER PIECES** and plaques can be supplied according to the customer requirements.

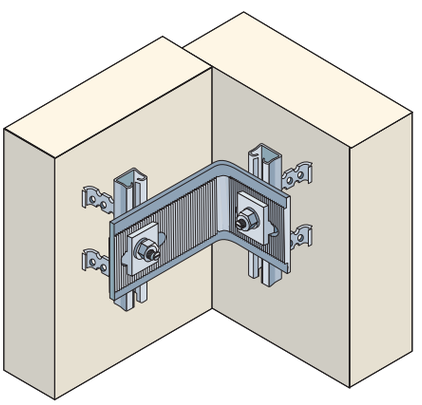
The tests are not expected, **unless on specific request;** and as a consequence, the customer can define the Project applicable loads.

Should corner pieces and plaques be used combined to **EDILMATIC ANCHOR CHANNELS,** it goes without saying that the project applicable load depends on the used channel capacity.

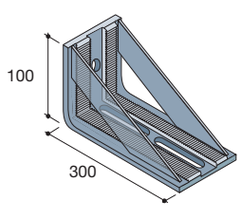
They are supplied with cold electrolyte galvanising (UNI EN ISO 2081), raw, with no surface covering and on demand hot-dip galvanised (UNI EN ISO 1461)

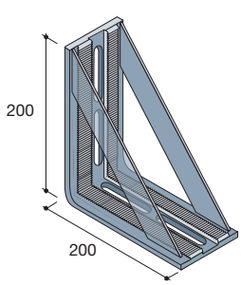
Hereinafter a few examples of **corner pieces** and **Plaques** which are customised and more frequently ordered for some applications.

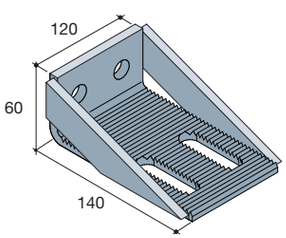




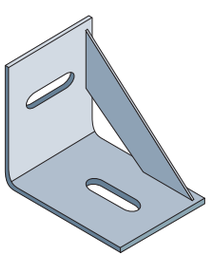
Knurled corner pieces
On demand

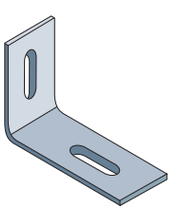


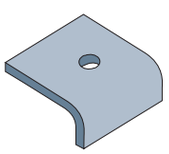




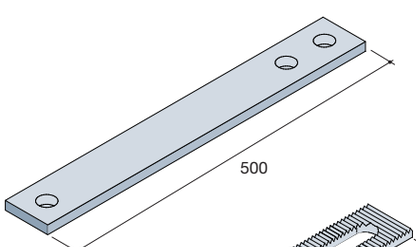
Smooth corner pieces
On demand

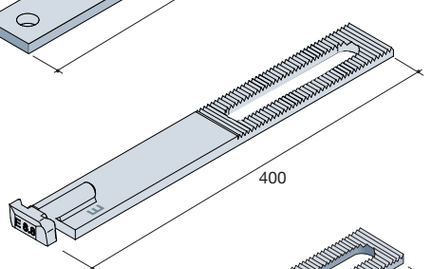


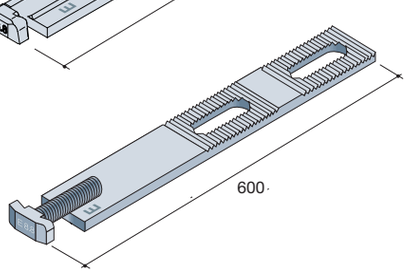




Smooth plaques







5 SMALL BRACKETS - ANGLE BRACKETS

KNURLED PLATES

EN 1090-1:2011

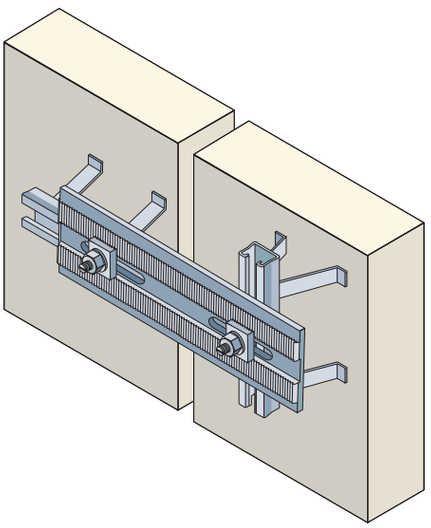
The knurled plates are used for the production of standard squares, and they can also be used in the original shape for specific applications such as the adjacent part junction.

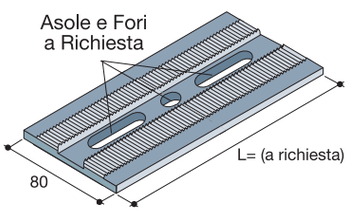
They are available in three different models and in three different lengths:
- **Knurled Plate L = 294 mm** (Fig.1)
- **Knurled Plate L = 388 mm** (Fig.2)
- **Knurled Plate L = 194 mm** (Fig.3)

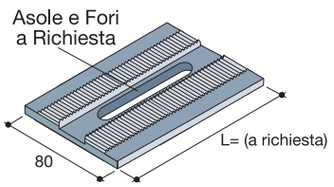
On demand, from the **Knurled Plate L = 388,** it is possible to manufacture customised plates in different lengths and with slots and/holes in any useful position for the application.

The plates can be cold electrolytically galvanised, or can be raw with no surface covering.

For more information get in touch with Edilmatic Technical Department.







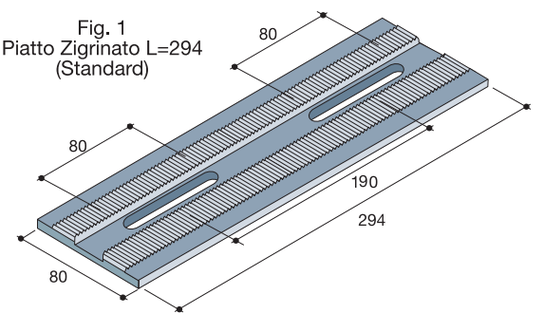


Fig. 1
Piatto Zigrinato L=294
(Standard)

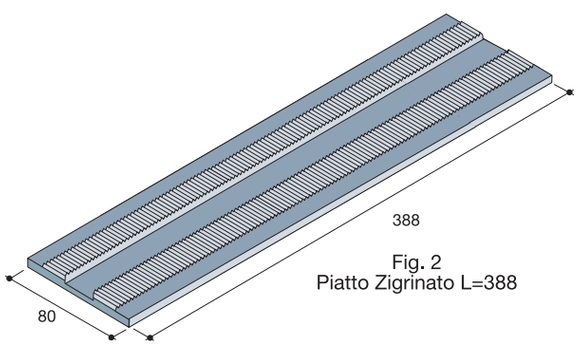


Fig. 2
Piatto Zigrinato L=388

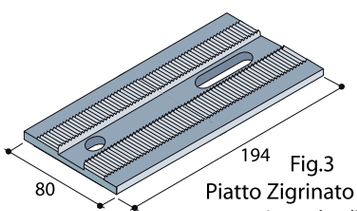


Fig.3
Piatto Zigrinato L=194
(standard)

5 SMALL BRACKETS - ANGLE BRACKETS

SPECIAL FRG CORNERPIECE

CE
EN 1090-1:2011

The corner piece for the FRG eaves retention is mainly designed to be fitted in case of eave beams which considering their specific shape do not allow to supplement any insert after the anchoring. The specific shape of the FRG corner piece allows to connect it to the hollow beam part thus safely anchoring the panel or the other anchoring parts.

The beam "tooth" fitting is possible in case of thickness varying from 5 to 10 cm.

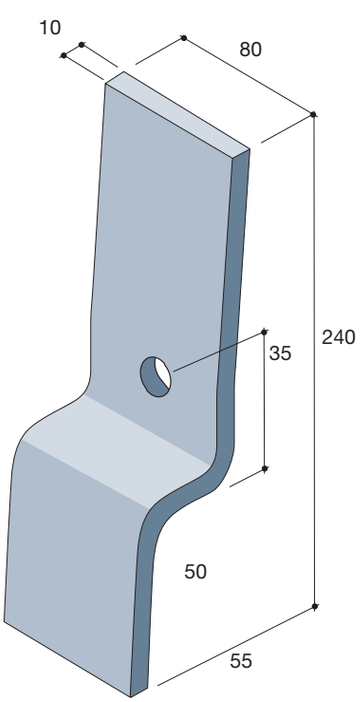
For the application it is possible to use Anchor channels GD - GE - GM with different clamping, and the Bolts TAG1 and TA24.
In the table 1 there are the different admitted loads according to the type of channel and the type of used clamping.

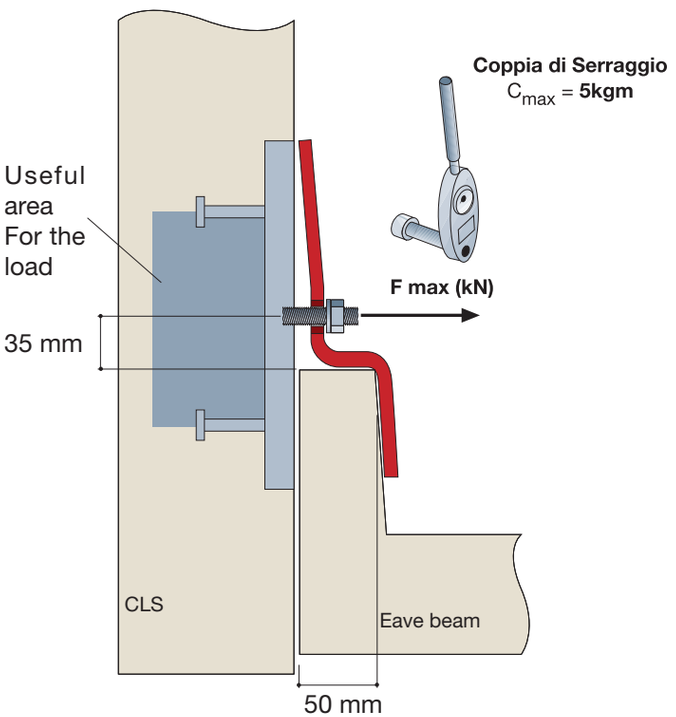
The Length "L" of the TAG anchoring bolts can be selected according to the connection thickness.

For a correct system use, it is necessary to comply with the reported tightening torque and forecast a channel connection in the area between the clamps, as in the side Picture.

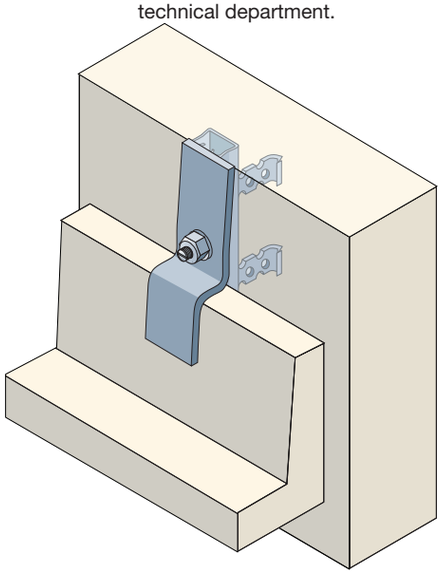
The FRG cornerpieces are in steel S355JR and they can be supplied cold electrolytically galvanised (UNI ISO 2018), raw with no surface treatment or with and hot-dip galvanising as well (UNI EN 1461)

They can also be made in INOX AISI 304 and/or AISI 304.





* For different anchoring system, get in touch with the Edilmatic technical department.



Type of TOOTHED	Design load N_{RD} (kN)		
	With squares S1/S2	With pegs P1	With welded clamps
GD	10.7	10.7	10.7
GE	17.5	17.5	17.5
GM	26.6	26.6	26.6

EDILMATIC

Anchorage, supporting and lifting
systems for prefabricated elements.
Accessories, fasteners and metal small parts.

EDILMATIC srl
Office and Factory: Via Gonzaga, 11
46020 Pegognaga (MN) Italy
tel. +39-0376-558225 - fax +39-0376-558672
E-mail: info@edilmatic.it - internet: www.edilmatic.it

CERTIFIED IQNet QUALITY SYSTEM

ICMQ
NORMA UNI EN ISO 9001
CERTIFICAZIONE SISTEMA QUALITÀ
CERTIFICATO N. 93048

ACCREDITATO
INSERTI QUALITA'

Edilmatic QR Code