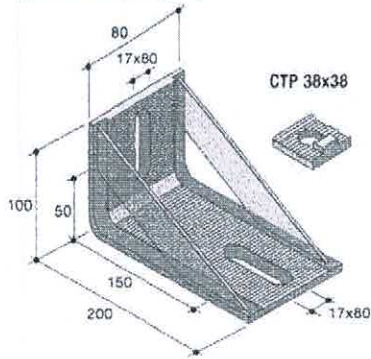


# VERANKERUNGSSYSTEME HALTERUNGEN

CE  
EN 1090-1:2011

## BESONDERE ZUBEHÖRE

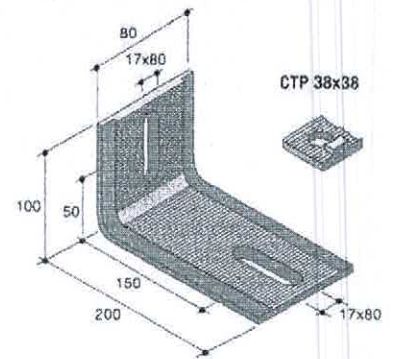
**EDIL 1  
(mit Bewehrungen)**



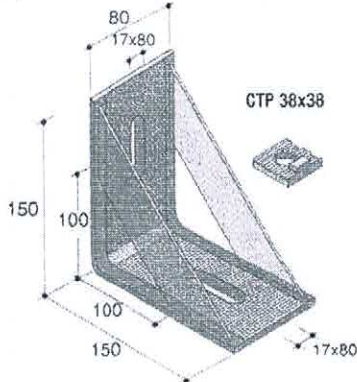
## TRAGKRÄFTE

Verbindungsstypen	Design Belastung $N_{RD}$
OHNE Bewehrungen	4.0 kN
MIT Bewehrungen	Je nach Ankerschiene

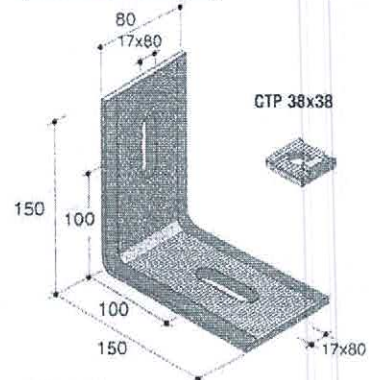
**EDIL 1-sR  
(ohne Bewehrungen)**



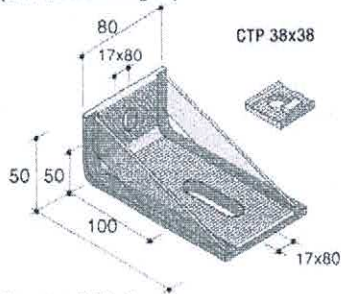
**EDIL 2  
(mit Bewehrungen)**



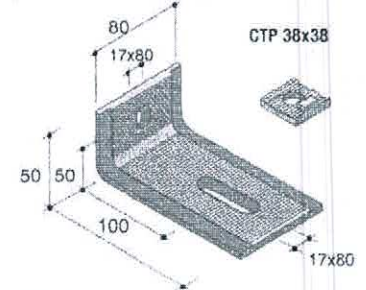
**EDIL 2-sR  
(ohne Bewehrungen)**



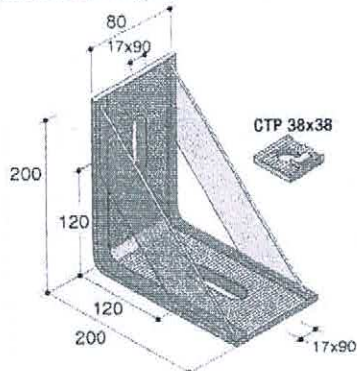
**EDIL 3  
(mit Bewehrungen)**



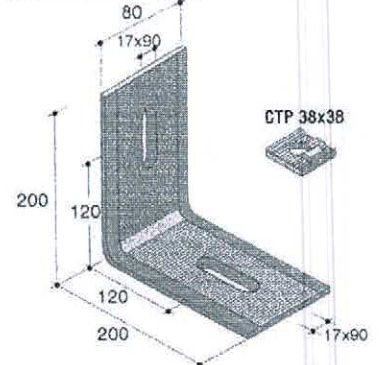
**EDIL 3-R  
(ohne Bewehrungen).**



**Square EDIL 4  
(mit Bewehrungen)**



**EDIL 4-sR  
(ohne Bewehrungen)**



# VERANKERUNGSTECHNIK VERBINDUNGEN

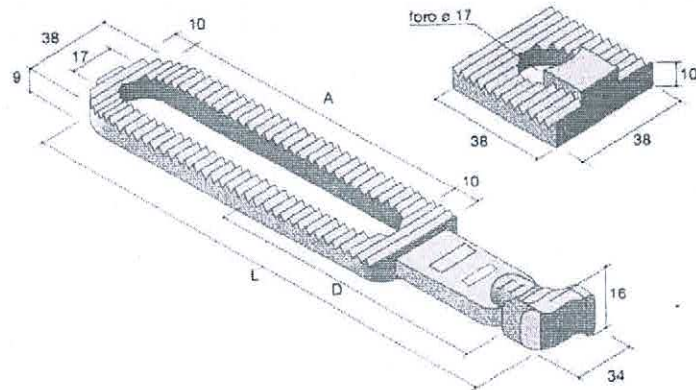


## BESONDERE ZUBEHÖRE

### ANKERKOPFVERBINDUNG FÜR ANKERSCHIENE GD

#### GRÖßE

Typ	Größe D	Größe A
L = 100 mm	50	50
l ≤ 150 mm	85	90
l ≤ 200 mm	125	120
l ≤ 250 mm	170	120



#### ADAPTIERUNGSMABEN

TABELLE 1

Verankerungs- und adaptierungsabstände

	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

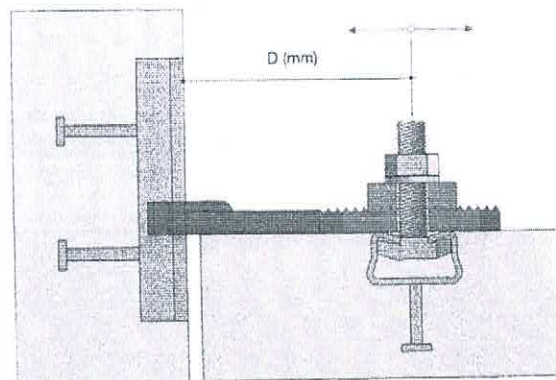
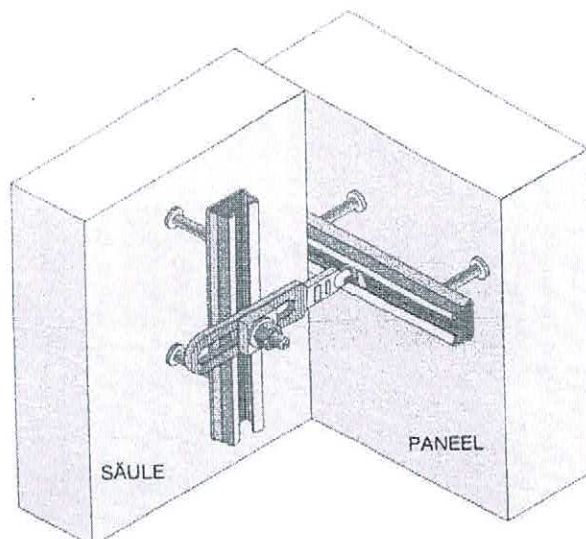


TABELLE 2

Kombinationen und verwendete belastungen

	Anchoring part Used channel	Anchoring part Used channel	Load of the project $N_{d0}$ (kN)
Bolts TAG1	Type GD	Type GD	10.7





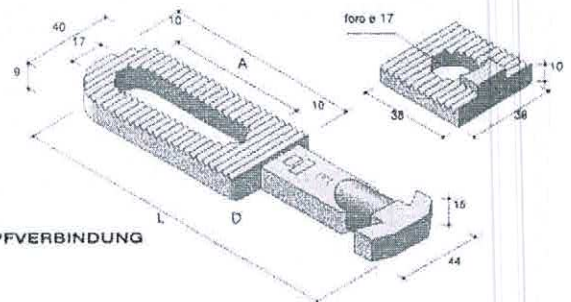
# VERANKERUNGSTECHNIK VERBINDUNGEN

## BESONDERE ZUBEHÖRE

### ANKERKOPFVERBINDUNG FÜR ANKERSCHIENE GE GM

#### GRÖßE

Typ	Größe D	Größe A
L = 185 mm	110	100
L = 200 mm	130	100
L = 250 mm	170	120
L = 300 mm	220	120



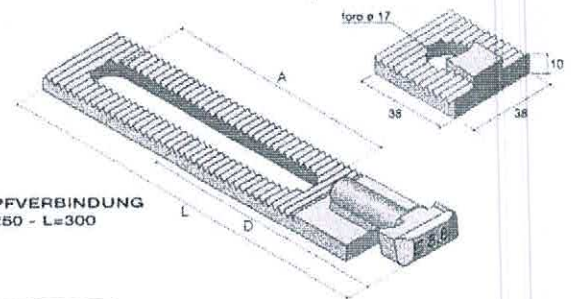
ANKERKOPFVERBINDUNG  
L=185

TABELLE 1

Verankerungs und adaptierungsabstände

TYP	D (mm)		
	D (mm)	D Min (mm)	D Max (mm)
L = 185 mm	110	70	150
L = 200 mm	130	80	170
L = 250 mm	170	110	220
L = 300 mm	220	160	270

TAG2



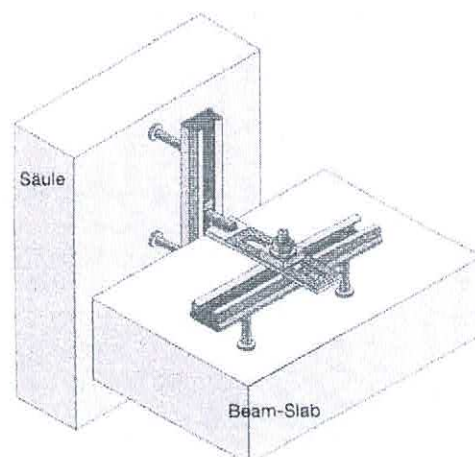
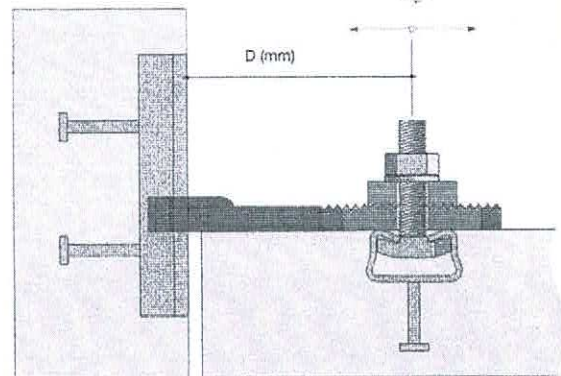
ANKERKOPFVERBINDUNG  
L=200 - L=250 - L=300

TABELLE 2

Kombinationen und verwendete belastungen

Anchoring part	Anchoring part	Load of the project $N_{po}$ (kN)
Type GE	Type GE	17.5
Type GM	Type GM	26.6

TAG2



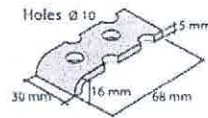


# Profiles with Z1 welded clamps

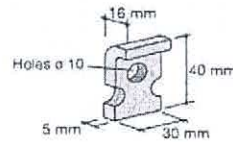
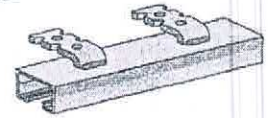
## SPECIAL APPLICATIONS

**THE PROFILES WITH WELDED Z1 CLAMPS** are a special production available for the hollow profiles type "M" - "E" - "D" - "H" in all standard lengths (in cut down sizes and/or 3m bars), as shown in the catalogue.

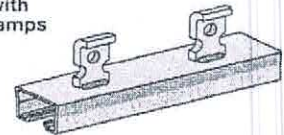
For special applications, with particularly thin elements in CLS and/or of very low thickness, 2 special Z1 clamps are available, the **short Z1 Clamp** and the **side Z1 Clamp**, which can be attached on the corresponding profiles; they have very small dimensions and quite high static performances (useful capacities), considering the small thicknesses in which they will be placed.



Profiles with Z1 side clamps



Profiles with short Z1 clamps



### SIDE Z1 CLAMP

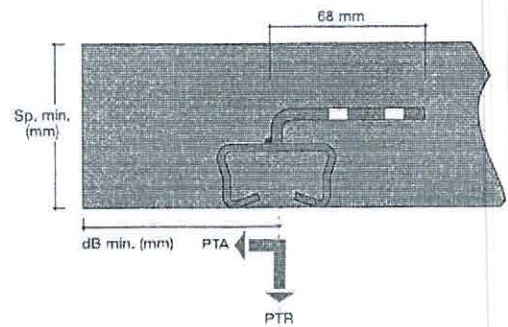
The hollow profiles with Z1 clamp are suitable for applications in very thin elements possibly under only retention loads.

The max. loads applicable refer to a concrete with  $R_{cK} < 25 \text{ N/mm}^2$ . For concrete of lower classes it should be planned additional reinforcing structures.

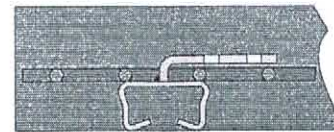
The maximum applicable loads, shown in the table, refer to a concrete with  $R_{cK} \geq 25 \text{ N/mm}^2$



Profile Type	Sp. min. (mm)	dB min. (mm)	Pmax TENSILE (kN)	Pmax CUTTING (kN)
Type H profile (42x20x2.5)	50	80	PTR max 8 kN	PTA max 8 kN
Type D profile (46x22x2.5)	60	80	PTR max 9 kN	PTA max 9 kN
Type E profile (58x31x3)	80	100	PTR max 10 kN	PTA max 10 kN



Additional reinforcing structure (bars and/or electro-welded net) with concrete with  $R_{cK} < 25 \text{ N/mm}^2$



### SHORT Z1 CLAMP

The hollow profiles with short Z1 clamps are suitable for applications in thin elements which can be used also as anchoring elements.

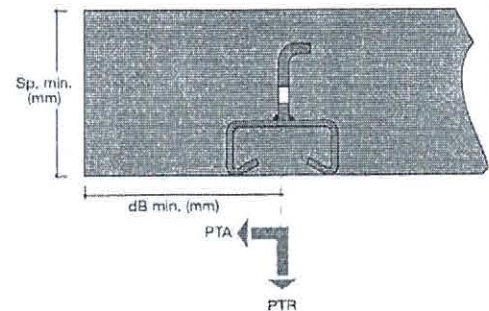
The max. applicable loads refer to a concrete with  $R_{cK} < 25 \text{ N/mm}^2$

For concrete of lower classes it should be planned additional reinforcing structures.

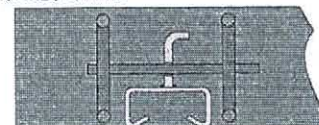
The maximum applicable loads, shown in the table, refer to a concrete with  $R_{cK} \geq 25 \text{ N/mm}^2$



Profile Type	Sp. min. (mm)	dB min. (mm)	Pmax TENSILE (kN)	Pmax CUTTING (kN)
Type H profile (42x20x2.5)	80	80	PTR max 9 kN	PTA max 9 kN
Type D profile (46x22x2.5)	90	90	PTR max 10 kN	PTA max 10 kN
Type E profile (58x31x3)	100	100	PTR max 11 kN	PTA max 11 kN



Additional reinforcing structure (bar and/or stirruping) with concrete with  $R_{cK} < 25 \text{ N/mm}^2$



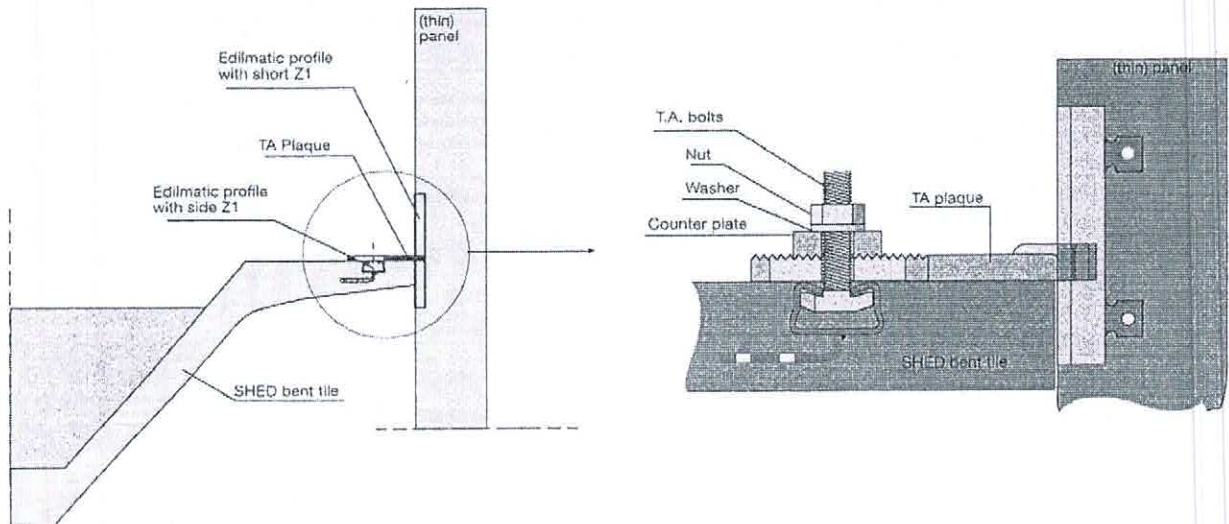
# Profiles with Z1 welded clamps

## SPECIAL APPLICATIONS

### APPLICATION EXAMPLES

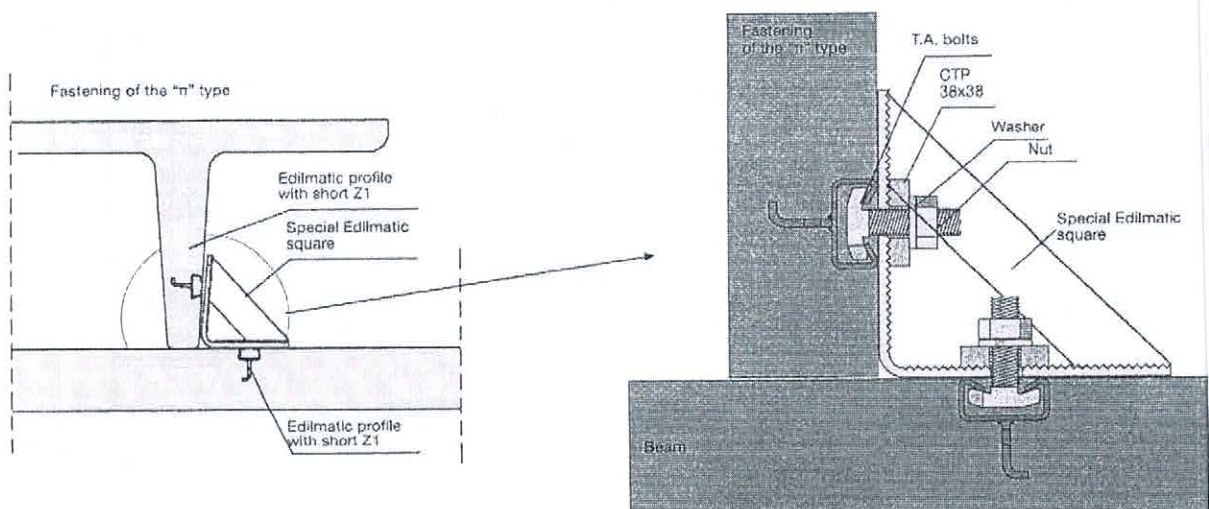
#### EXAMPLES 1

Retention of thin SHED bent tile covering panels in the cleat area with TA Plaques and Edilmatic accessories



#### EXAMPLES 2

Fastening of the "π" type covering bent tile to the beam in the rib area with Edilmatic squares and accessories.





# Retention plaques

## GENERAL

The **EDILMATIC PLAQUES** are designed to solve the retention problems of concrete products.

They are available in different lengths, depending on the anchorage distances and in different forms, depending on the loads and on other types of hollow profiles which we intend to use. The slot on the plaque's back offers a wide regulation range of the retaining distances and the knurled coupling with the counter-plate prevents sliding problems after the tightening.

In all plaque types, in the different positions, there are product traceability markings identifying the producer (E = Edilmatic) and the lot code (reference to the material casting number - production month and year) as a warranty of **QUALITY** and proof of the controls carried out.

### Hook head plaques (PTA)

They are knurled plaques made of quality steel S355J2G3 (UNI EN 10025) and delivered with UNI EN ISO 2081 (yellow) cold electrolytic zinc-plating.

They can be used with middle-heavy profiles for middle-high loads and are available in 4 different types with different "L" lengths:

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

Thanks to the slot on the plaques back you can use TA M14 and/or M16 bolts depending on the hollow profile used.

For the fastening of the plaques to the elements in anchorage the use of the knurled 38x38 counter-plate is compulsory (CTP).

### Plaques with threaded bush (PB)

These knurled plaques are made of quality steel CF9SMnPb36 (UNI EN 10083) and delivered with UNI EN ISO 2081 (yellow) cold electrolytic zinc-plating.

They are recommended for applications with very high retention distances and when a higher regulation precision is required.

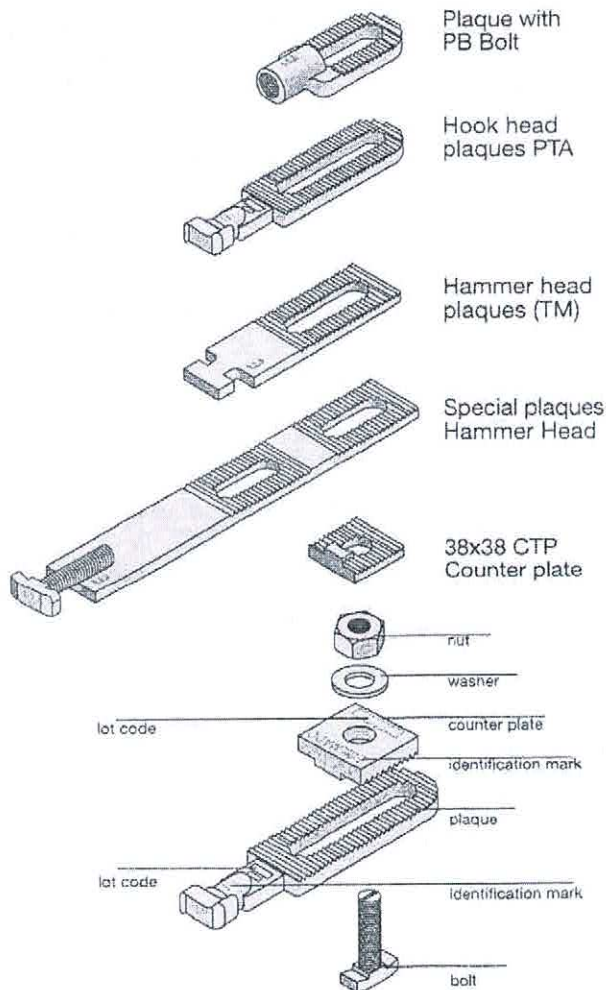
Thanks to the matching with bolts, available in different lengths, you can reach all retention distances, necessary to establish the connection.

### Hammer head plaques (PTM)

These knurled plaques are obtained using S235JRG1 (UNI EN 10025) steel and delivered with UNI EN ISO 2081 (yellow) old electrolytic zinc-plating.

They can be used with light hollow profiles and are recommended for retentions with light design loads.

For the plaques fastening to the anchorage elements you must use a 38x38 knurled counter-plate (CTP).



### Materials

Type plaque	Material	Mechanical Characteristics	Reference regulations	Kind of coating
TM Plaques	S235JRG1	s rott. = 340÷470 N/mm <sup>2</sup> A% = 26	UNI EN 10025 [DIN 17100]	yellow old electrolytic zinc-plating (UNI EN ISO 2081)
TA Plaques	S355J2G3	s rott. = 490÷630 N/mm <sup>2</sup> A% = 22	UNI EN 10025 [DIN 17100]	
PB Plaques	CF9SMnPb36	s rott. = 490÷630 N/mm <sup>2</sup> A% = 22	UNI EN 10087 [DIN 1651]	Sp <sub>min</sub> = 12 micron

The Technical Department is at disposal in order to release ON DEMAND test certifications both on RAW MATERIAL and PRODUCT. The test certifications available for each lot bought.

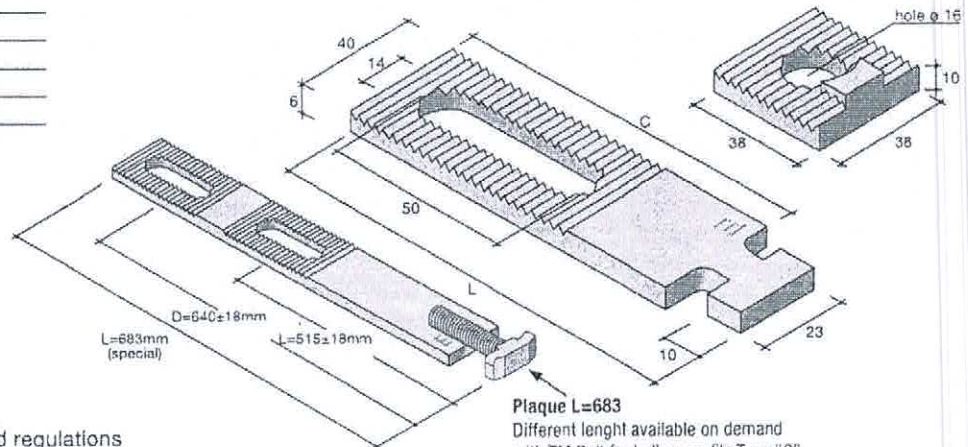


# Retention plaques

## HAMMER HEAD PLAQUES (TM)

### Dimension

Plaque Type	C Value
L = 120 mm	102
L = 150 mm	132
L = 200 mm	182
L = 250 mm	232
L = 683 mm	665



### ASSEMBLY DATA

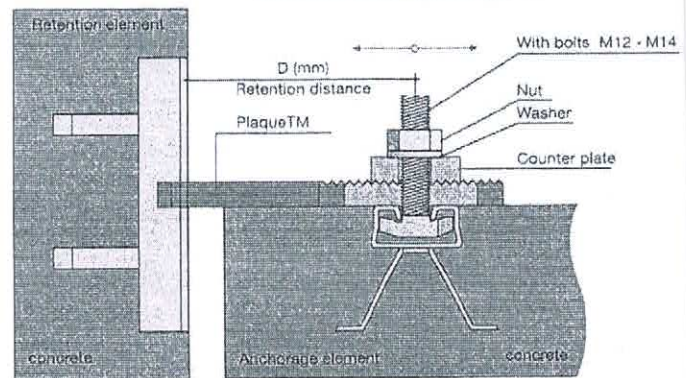
TABLE 1

Retention distances and regulations

With bolts TM M12 - TA M14	Plaque Type L	Anchorage distance D (mm)		
		D (mm)	D Min. (mm)	D Max. (mm)
L = 120 mm	63	44	82	
L = 150 mm	93	74	112	
L = 200 mm	143	124	162	
L = 250 mm	193	174	212	
L = 683 mm	see side picture			

The **TM L=683mm** plaque is a special type available on stock for special applications. If necessary on request, we can deliver TM special plaques with "L" length defined by the customer.

For additional information please contact the Engineering Department.



The **D VALUE** is the medium distance that can be reached using the different plaques types calculated from the profile's centre in the anchoring element to the retained element.

The **D max.** and **D min.** values are the minimum and maximum distances that can be reached using the plaques slot.

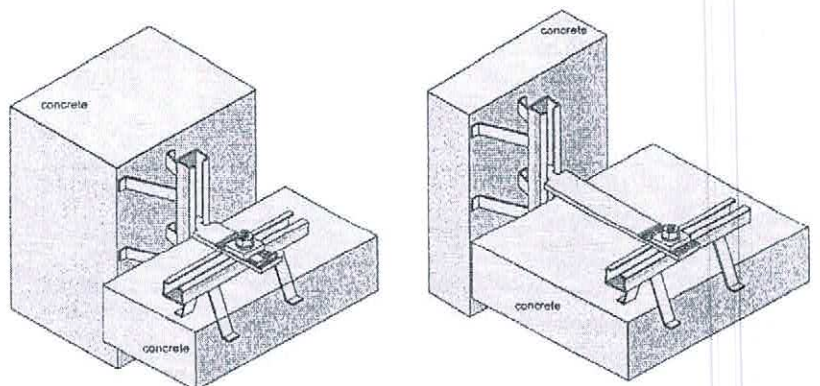
TABLE 2

Matches and loads that can be used (for profiles with P1 pegs and S1 brackets)

	Anchorage element	Retention element	Maximum load applicable to the system (kN)
	Profile to be used	Profile to be used	
with bolts with TM M12	C Type	C Type	8
with bolts TA M14	D Type	C Type	8

The max. load applicable to the system refers to the max. profile load used in the **RETAINED** element.

### Application examples



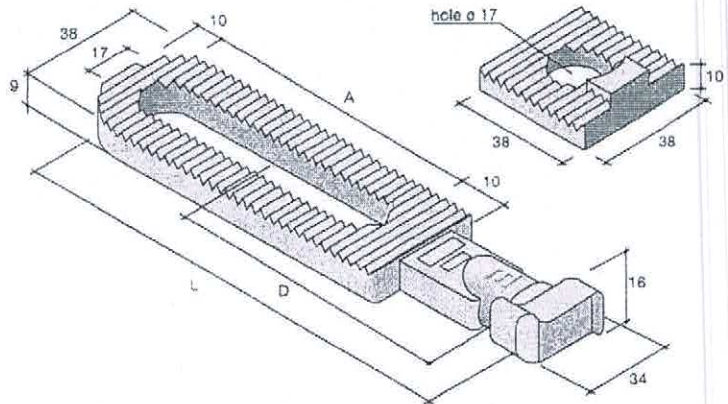


# Retention plaques

## HOOK HEAD PLAQUES (TA)

### Dimension

Plaque Type	Value D	Value A
L = 100 mm	50	50
L = 150 mm	85	90
L = 200 mm	125	120
L = 250 mm	170	120

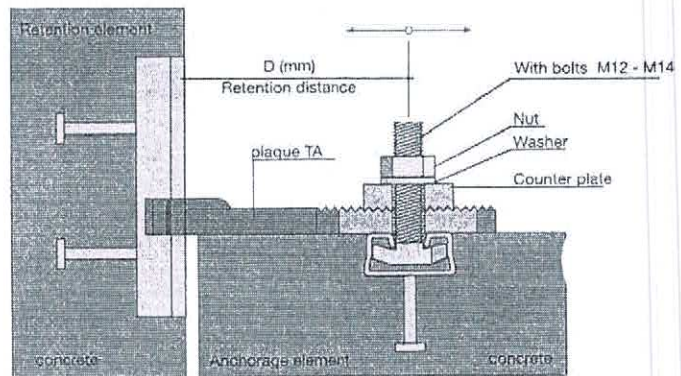


### ASSEMBLY DATA

TABLE 1

Retention distance and settings

With bolts M14 - M16	Plaque Type	Anchorage distance D (mm)		
	L	D (mm)	D Min. (mm)	D Max. (mm)
With bolts M14 - M16	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 **D VALUE** is the medium distance that can be reached using the different plaques calculated from the profile's centre in the ANCHORING element to the RETAINED element.

The **D max. and D min.** values are the minimum and maximum distances that can be reached using the plaques slots.

### ALLOWED MAX. LOADS

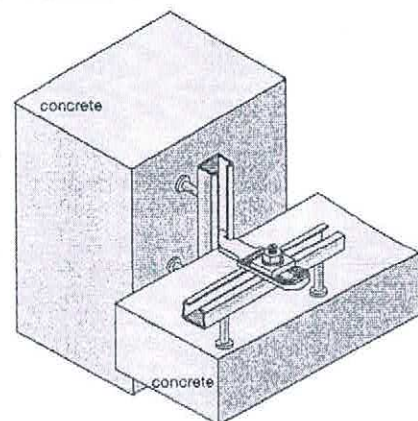
TABLE 2

Combinations and max. loads used  
(for profiles with Z1 clamps and P1 pegs)

	Anchorage element	Retention element	Maximum load applicable to the system (kN)
	Profile to be used	Profile to be used	
With bolts TA M14	H Type	A Type	11
	H30 Type	F Type	13
	D Type	C Type	13
With bolts TA M16	E Type	H Type	11
		H30 Type	13
	M Type	D Type	13

The max. load applicable to the system refers to the max. profile load used in the **RETAINED** element.

### Application examples



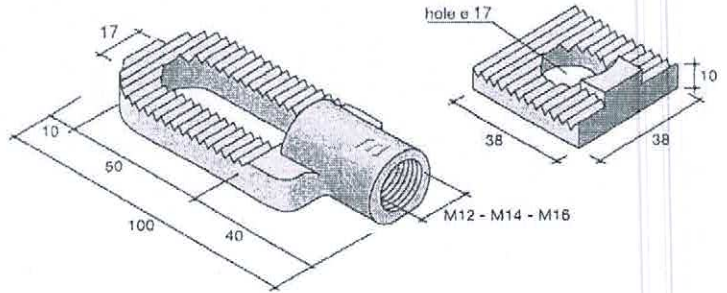


# Retention plaques

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

The Edilmatic Plaques with bush have been studied for coupling with all TA and TM bolt types (M12-M14-M16) for applications require a high requiring distance and a more precise adjustment but also when it is necessary to balance any profile positioning errors. Using the bolts available in different lengths it is possible to reach any useful distance.

The bolt must be screwed up for at least 20 mm in the plaque bush and the tightening in the retained element profile has to be carried out using nuts and washers.



### Assembly data

Depending on the "D" retention distance we calculate the "L" Length of the bolt which has to be coupled.

The bolt must be screwed up for at least 20 mm in the bush, as a consequence we obtain the value "A" = 40 mm

The "L" bolt length results from the formula:

$$L = D - 40 \text{ mm} \quad \dots \text{ where}$$

L = Bolt length  
D = Retention distance

Es: retention distance = 100 mm

$$L \text{ bolt length} = D - 40 \text{ mm} = 100 - 40 = 60$$

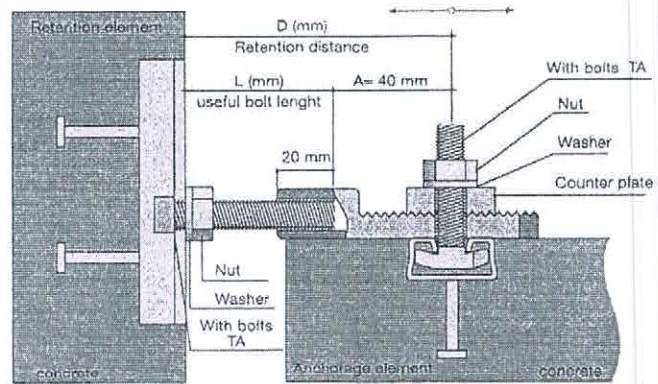
(L bolt length = 60 mm)

TABLE 1

Combinations and used loads  
(for profiles with Z1 clamps and P1 pegs)

	Anchorage element Profile to be used	Retention element Profile to be used	Maximum load applicable to the system (kN)
With bolts TM M12	C Type	C Type	8
With bolts TA M14	H Type	H Type	11
	H30 Type	H30 Type	13
	D Type	D Type	13
With bolts TA M12	E Type	E Type	17
	M Type	M Type	32

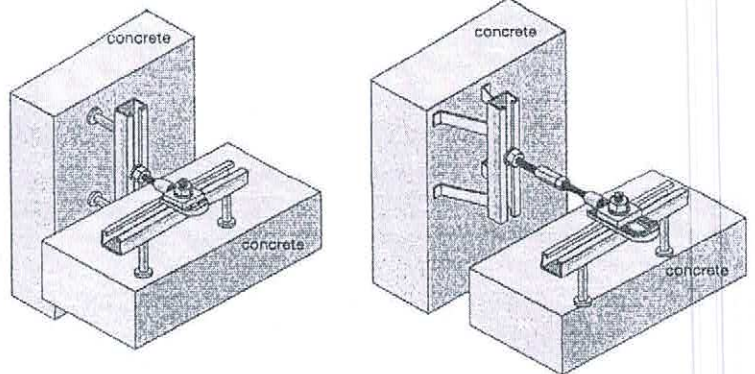
The max. load applicable to the system is the profile **Max. tensile capacity** in the **RE-TAINED** element.



The "D" distance is the medium distance that can be reached using the different bolts calculated from the profile's centre in the ANCHORING element to the RETAINED element. Using the PLAQUE slot (50 mm) this distance can vary [(D ± 18 mm)].

Acting on the coupled bolt before the fastening you can make other millimetre adjustments to obtain an optimal retention.

### Application examples





# Retention plaques

## PLAQUE HOOK HAED

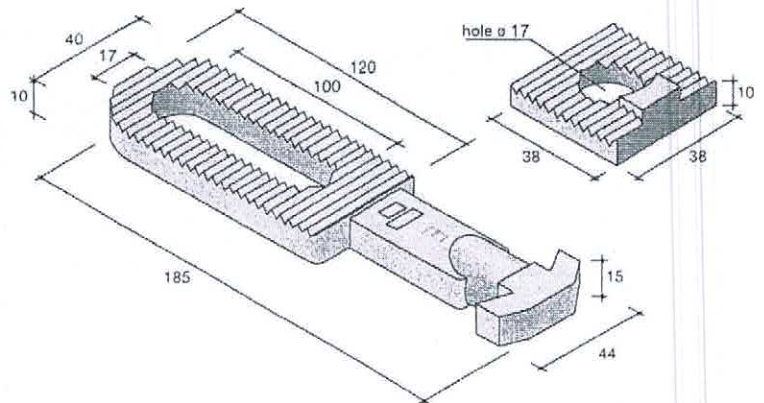
L = 185 mm

The plaque hook head L=185mm can be used with HOLLOW PROFILES type E and M, for fastening the anchoring element TA M16 bolts must be used.

It is particularly recommended for the retention of elements in concrete with middle-high loads requiring the use of middle-heavy profiles.

It is made of S355J2G3 UNI EN 10025 quality steel.

It is delivered cold electrolytic zinc-plated (UNI EN ISO 2081).



### ASSEMBLY DATA

TABLE 1

Retention distance and adjustments

With bolts M16	Plaque Type	Anchorage distance D (mm)		
		D (mm)	D Min. (mm)	D Max. (mm)
L = 185 mm	L	110	70	150

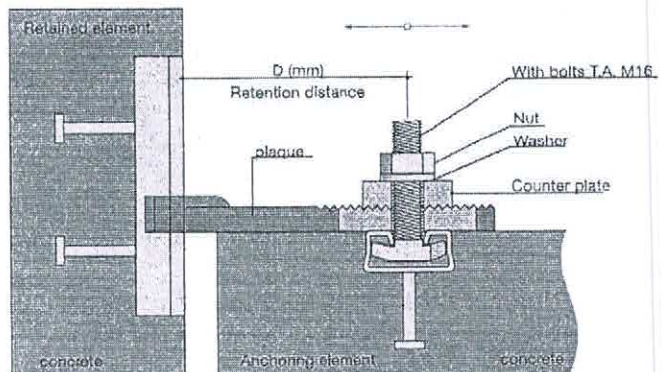
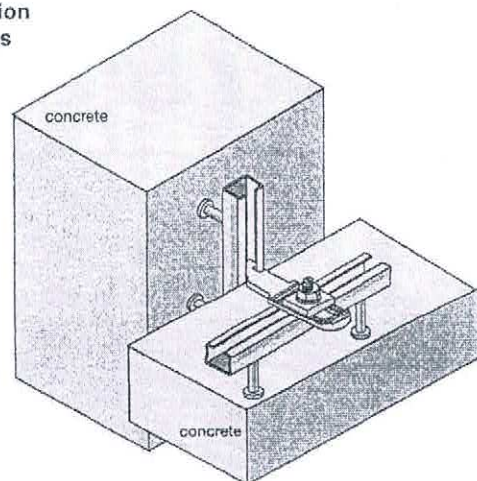


TABLE 1

Combinations and max. loads used  
(for profiles with Z1 clamps and P1 pegs)

With bolts TM M16	Anchorage element	Retention element	Maximum load applicable to the system (kN)
	Profile to be used	Profile to be used	
	Tipo E	Tipo E	17
	Tipo M	Tipo M	32

### Application examples



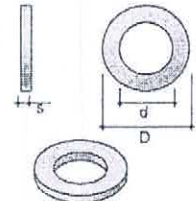
The max. load applicable to the system refers to the max. profile capacity used in the RETAINED element.



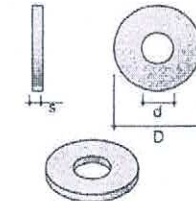
# Standard Accessories

## ACCESSORIES FOR BOLTS

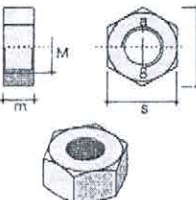
### STANDARD WASHERS

UNI EN ISO 7089 Class R40 Zinc-plated	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

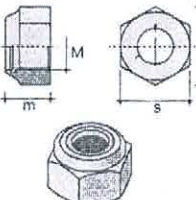
### BIG WASHERS

UNI EN ISO 7093 Class R40 Zinc-plated	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

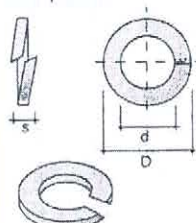
### MIDDLE NUTS

UNI EN ISO 4034 Class 8 - 6s (according to UNI 3740/4*) Zinc-plated	for bolts	D (mm)	d (mm)	s (mm)
	M10	17	18.9	8
	M12	19	21.1	10
	M14	22	24.5	11
	M16	24	26.8	13

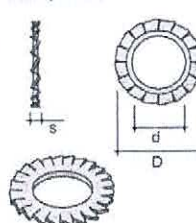
### SELF-LOCKING NUTS

UNI 7473 - ISO 2358 Class 8 - 6s (according to UNI 3740/4*) Zinc-plated	for bolts	D (mm)	d (mm)	s (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 type)

UNI 1751 DIN 127 B Class R 150 Zinc-plated	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

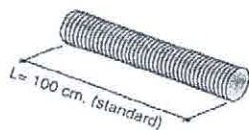
### TOOTHED WASHERS (external)

UNI 8842 A DIN 6798 A Class HRC 38-45 Zinc-plated	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

ISO Metric thread  
DIN 975 - C40 (class 6.8)  
Zinc-plated

The standard length is L = 100 cm.  
On request they can be delivered  
in any length



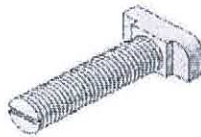
Also available in 8.8 class and B7 (ASTM A-193)

thread (M)	length (L=cm.)	maximum load allowed (kN)
M10	100	16
M12	100	23
M14	100	32
M16	100	44
M18	100	53
M20	100	68
M24	100	98



## FEATURES

- TM Bolts matching with **GI** and **GF** Anchor Channels
- Available in Hot-dip Galvanized version
- Available also in Stainless Steel version (but only on request)
- Load bearing capacity in 2 directions
- Easy and safe installation check thanks to the NOTCH for marking position

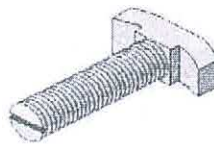


## HAMMER HEAD BOLTS: TM

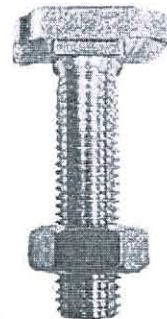


## FEATURES

- TA Bolts matching with **GD**, **GE** and **GM** Anchor Channels
- Available in Hot-dip Galvanized version
- Available also in Stainless Steel version (but only on request)
- The Anchor head prevents the TA bolt rotating under dynamic or seismic loading
- Easy and safe installation check thanks to the NOTCH for marking position



## ANCHOR HEAD BOLTS: TA



All Edilmatic BOLTS have the Identification Mark and are available in different lengths







## PRODUCT INFORMATION

All Edilmatic TM and TA Bolts have a Strength grade 8.8, according to UNI EN ISO 898.

Corrosion protection provided by Hot-dip galvanized (coating  $\geq 50\mu\text{m}$ ), according to UNI EN 4042.

Edilmatic TM and TA Bolts are quoted and available in Hot-dip Galvanized version.  
The Stainless Steel version (A4) is available and quoted only on request.

## CODIFICATIONS & ORDERS

Each Bolt and related accessory are identified through alphanumeric codes as to describe in detail all features.  
The following table contains the main abbreviations used in such codes:

**Table: abbreviation**

TM	Hammer Head Bolt
TA	Anchor Head Bolt
TMG1	Hammer Head Bolt for GF Anchor Channel
TMG2	Hammer Head Bolt for GI Anchor Channel
TAG1	Anchor Head Bolt for GD Anchor Channel
TAG2	Anchor Head Bolt for GE and GM Anchor Channel
ZC	Hot-dip Galvanized
L	Length (mm)

## Examples of alphanumeric CODES

			Type of Thread		Hot-dip
			M12		galvanized
			↑		↑
TMG21250ZC	=	TMG2	12	50	ZC
		↓		↓	
		Hammer Head Bolt		Length	
		for GI Anchor Channel		50mm	

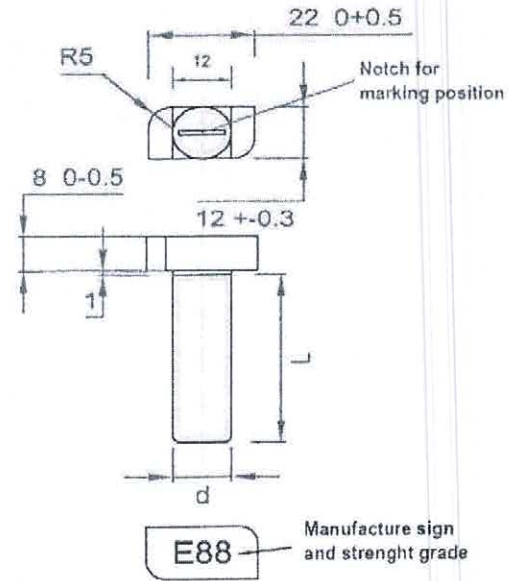


**HAMMER HEAD BOLT TMG1**

TMG Bolt	Thread: d	Length (mm): L	for Anchor Channel
TMG1	M12	70	GF (28x13x2,3)

\*Other lengths available on request

HDG_M10		
Code	Length (cm)	Price
TMG11270ZC	70	

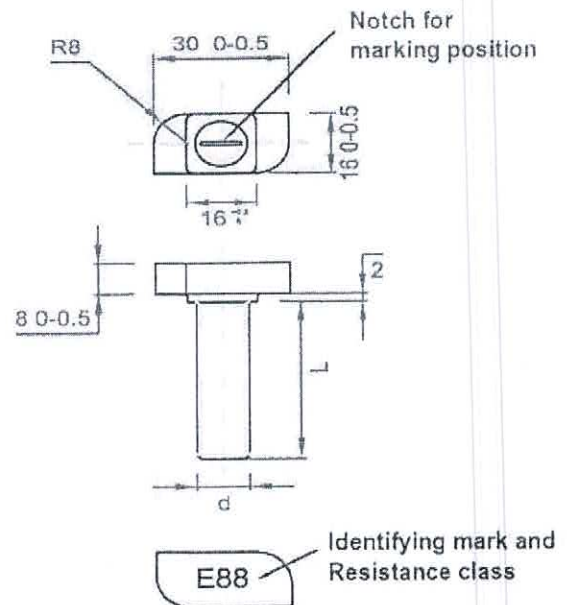


**HAMMER HEAD BOLT TMG2**

TMG Bolt	Thread: d	Length (mm): L	for Anchor Channel
TMG2	M12	50 / 70	GI (38x18x3)

\*Other lengths available on request

HDG_M12		
Code	Length (cm)	Price
TMG21250ZC	50	
TMG21270ZC	70	



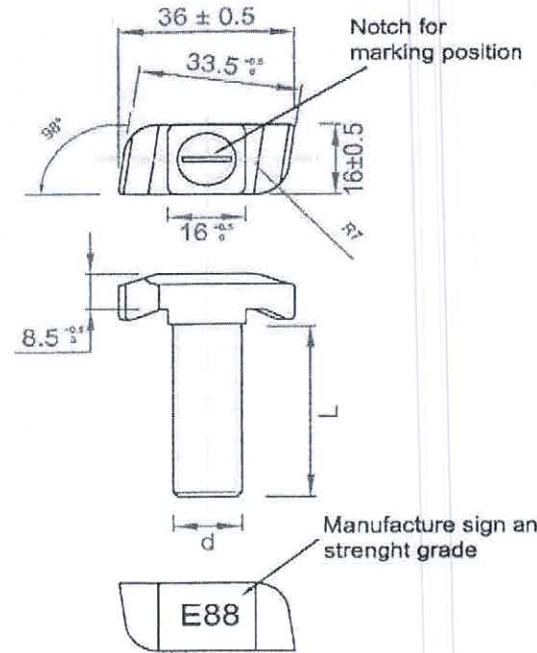




**ANCHOR HEAD BOLT TAG1**

TMG Bolt	Thread: d	Lenght (mm): L	for Anchor Channel
TAG1	M12	50/ 70 /	GD (40x25x2,5)
		100/ 150	
	M14	40/50/60/	
		70/80/	
		100/120/	
	M16	150/200 /	
250			
	M16	50/ 80 /	
		100/ 120	

\*Other lenghts available on request



HDG_M12		
Code	Lenght (cm)	Price
TAG11250ZC	50	
TAG11270ZC	70	
TAG112100ZC	100	
TAG112150ZC	150	

HDG_M14		
Code	Lenght (cm)	Price
TAG11440ZC	40	
TAG11450ZC	50	
TAG11460ZC	60	
TAG11470ZC	70	
TAG11480ZC	80	
TAG114100ZC	100	
TAG114120ZC	120	
TAG114150ZC	150	
TAG114200ZC	200	
TAG114250ZC	250	

HDG_M16		
Code	Lenght (cm)	Price
TAG11650ZC	50	
TAG11680ZC	80	
TAG116100ZC	100	
TAG116120ZC	120	



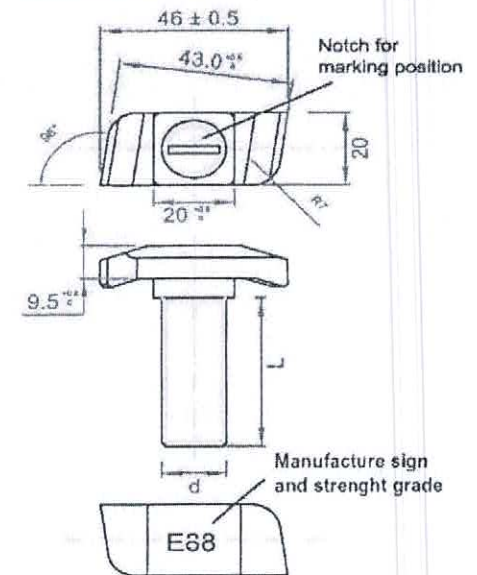
**ANCHOR HEAD BOLT TAG2**

TMG Bolt	Thread	Lenght (mm)	for Anchor Channel
TAG2	M16	50 / 60 / 80 / 100 / 150 / 200 / 250	GE (50x30x3) & GM (55x31x4)
	M20**	60 / 80 / 100 / 150	

\*\*M20 Bolts available only on request

HDG_ M16		
Code	Lenght (cm)	Price
TAG21650ZC	50	
TAG21660ZC	60	
TAG21680ZC	80	
TAG216100ZC	100	
TAG216150ZC	150	
TAG216200ZC	200	
TAG216250ZC	250	

HDG_ M20		
Code	Lenght (cm)	Price
TAG22060ZC	60	
TAG22080ZC	80	Only on request
TAG220100ZC	100	
TAG220150ZC	150	

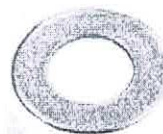


**NUTS & WASHERS**

NUTS_ HDG Class 8		
Code	Description	Price
D12ZC	12MA	
D14ZC	14MA	
D16ZC	16MA	



WASHERS_ HDG R40		
Code	Description	Price
R12ZC	D12	
R14ZC	D14	
R16ZC	D16	





## FIXING SYSTEMS - EDILMATIC PLAQUES



### PLAQUE with PB BOLT

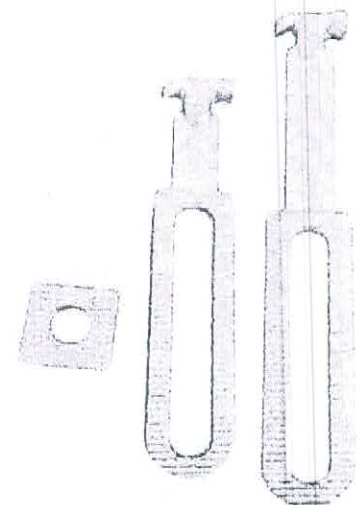
	Anchorage and Retention elements	
	Anchor Channels to be used	PB Bolt Plaque associated:
With TMG1 & TMG2 M12 Bolts	GF (28X13X2,3) & GI (38x18x3)	PB12ZC
With TAG1 M14 Bolts	GD (40x25x2,5)	PB14ZC
With TAG1 M16 & TAG2 M16 Bolts	GE (50x30x3) & GM (55x31x4)	PB16ZC



HDG_PB BOLT Plaques		
Code	Description	Price
PB12ZC	12MA	
PB14ZC	14MA	
PB16ZC	16MA	

### PLAQUE with ANCHOR HEAD

	Anchorage and Retention elements	
	Anchor Channels to be used	Anchor Head Plaque associated:
With TAG1 M14 Bolts	GD (40x25x2,5)	TA100ZC / TA150ZC / TA200ZC / TA250ZC
With TAG1 M16 & TAG2 M16 Bolts	GE (50x30x3) & GM (55x31x4)	TA185ZC



HDG_Anchor Head Plaques		
Code	Length (mm)	Price
TA100ZC	100	
TA150ZC	150	
TA185ZC	185	
TA200ZC	200	
TA250ZC	250	

### COUNTER PLATE for all PLAQUES

HDG_Counter Plate		
Code	Length (mm)	Price
CP38ZC	38x38	

