



# TENSA

## BARRE A FILETTATURA CONTINUA

Post-tensione  
Geotecnica

## CONTINUOUS THREAD STEEL BARS

Post-tensioning  
Geotechnics



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## Indice / Summary

pagina / pages

Introduzione / Introduction	4
Prodotti / Products	5
Campi di utilizzo / Fields of use	6
Y1050 – Barre da precompressione / Post-tensioning bars	12
B670 – Barre per opere geotecniche - Costruzione di gallerie Geotechnical bars – Tunnels construction	20
B500 – Barre per opere geotecniche / Bars for geotechnical works	30
Soluzioni applicative / Technical application of products	43

## Introduzione

Le barre fornite da TENSACCIAI sono le più diffuse sul mercato, e sono realizzate da Stahlwerk Annahütte, che è il più rinomato produttore internazionale. Questo ci consente di distribuire un prodotto con standard qualitativi elevati, dotato delle più importanti certificazioni di settore in tutti i principali paesi del mondo.

Naturalmente offriamo un'ampia gamma di prodotti standard, di larga e consolidata applicazione nei maggiori progetti in ogni parte del mondo, ma siamo in grado di offrire un elevato grado di personalizzazione in funzione delle esigenze legate alle specificità dei singoli progetti.

## Introduction

Steel bars supplied by TENSACCIAI are the most common and widely spread on the market, made by Stahlwerk Annahütte, the most famous international manufacturer.

This fact allows us to distribute a product with high quality standards, provided with the most important certifications in all relevant countries in the world.

Of course we can provide a wide range of standard products, with a wide and consolidated application in the most important project in every part of the world, but we are also able to offer a high level of product customisation, depending on special needs of single projects.

## Prodotti

TENSACCIAl fornisce barre a filettatura continua per post-tensione ed applicazioni geotecniche, come: costruzione di edifici, strade e viadotti, gallerie e miniere. Questi sistemi di connessione e fissaggio possono essere forniti in diametri variabili da 12 a 75mm, e sono usati in tutto il mondo in diversi campi, quali la geotecnica, la post-tensione e nei sistemi di precompressione in generale.



I vantaggi nell'impiego di questi sistemi di postensione sono molteplici, e sono comprovati dagli eccellenti risultati ottenuti nei vari cantieri di tutto il mondo:

- Facilità di movimentazione in sito
- Filettatura continua lungo tutta la lunghezza della barra, che garantisce un'aderenza ottimale con il getto in calcestruzzo
- Taglio a misura e possibilità di estensione con l'utilizzo di accoppiatori in qualsiasi posizione della barra
- Differenti possibilità per la protezione dai fenomeni corrosivi.

## Products

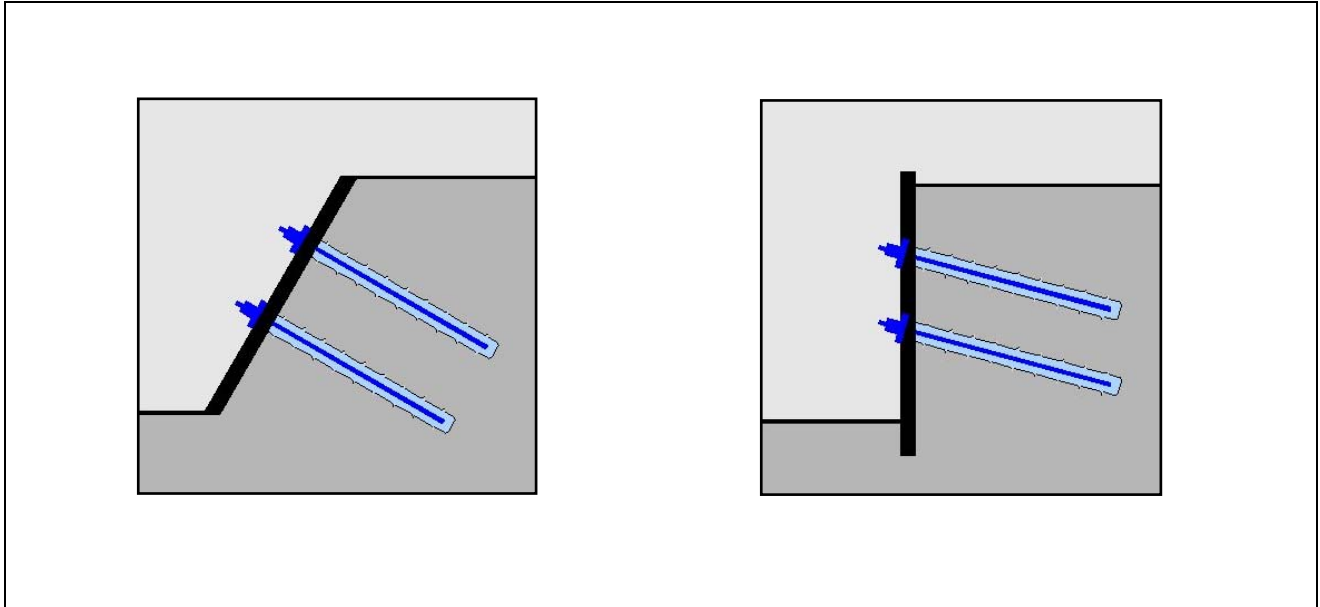
TENSACCIAl supply bars with continuous thread for post-tensioning and geotechnical applications, such as buildings, roads and viaducts, tunnels and mines. These fixing and connection systems can be provided in diameters varying from 12 to 75 mm, and are used worldwide in various fields, such as geotechnical, post-tensioning and in pre-tensioning systems in general.

The advantages in the use of these post-tensioning systems are many, and are supported by excellent results achieved in various sites around the world:

- Ease of handling on-site
- Continuous thread along the entire length of the bar, which ensures optimal adhesion with the cast in concrete
- Cut to size and possibility of extension using couplers in any position of the bar
- Different possibilities for protection against corrosive phenomena.

## Campi di utilizzo / Fields of use

### Strutture di contenimento / Containment structures – B500 – B670 – Y1050



#### In terreni coerenti ed incoerenti

- Per il contenimento di:
  - ◇ Sporgenze del terreno
  - ◇ Pareti di scavo di fondazioni
  - ◇ Declivi naturali
  - ◇ Rilevati in terra in caso di sottofondazioni
- Utilizzo temporaneo (inferiore a due anni) o permanente (superiore a due anni) con trattamento anticorrosivo di tipo semplice o doppio
- Foro iniettabile per tutta la lunghezza

La struttura di sostegno rimane elastica permettendo una ritaratura della eventuale compressione al variare della spinta attiva del terreno.

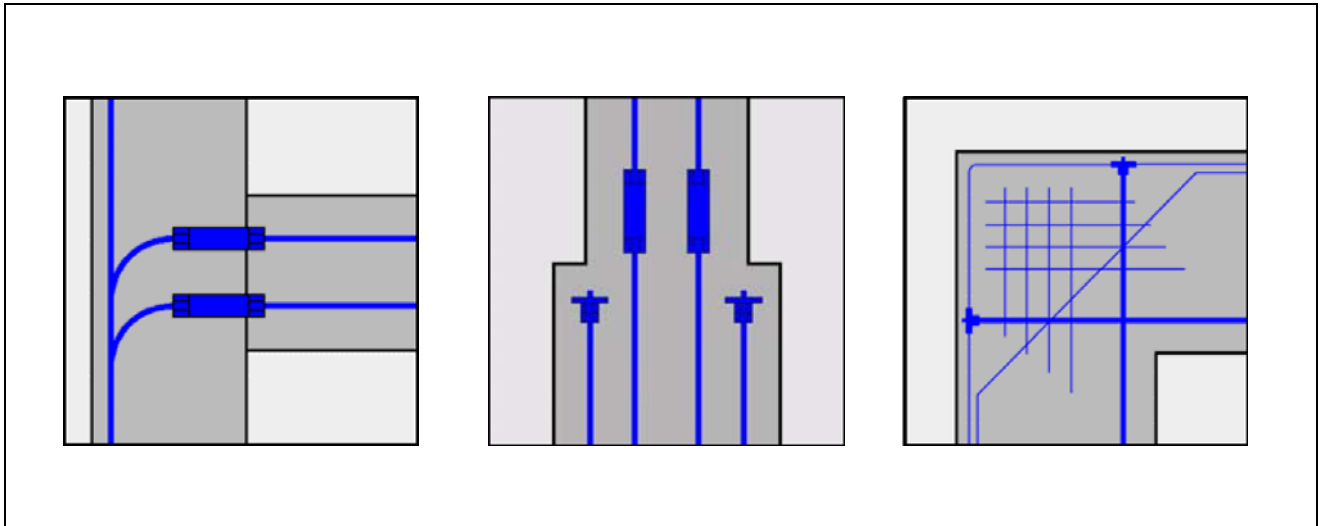
#### In coherent and incoherent ground

- For the containment of:
  - ◇ Discontinuity of the ground
  - ◇ Wall digging of foundations
  - ◇ Natural slopes
  - ◇ Rilevate in hearth in case of sub-foundations structures
- Temporary (less than two years) or permanent using (over two years) with a simple or double corrosion protection treatment
- Hole injection for the entire length

Support structure remains flexible allowing a recalibration of the eventual compression for any active soil thrust variation.

## Campi di utilizzo / Fields of use

### Sistemi di accoppiamento / Coupling systems – B500



#### Soluzioni economiche per armatura

Il sistema di accoppiamento realizzato con barre SAS 500 a filettatura continua sostituisce molti altri sistemi di accoppiamento utilizzati fino ad oggi.

Consente numerose tipologie di impiego.

Il sistema consente l'accoppiamento di barre di diametro variabile tra 12mm e 50mm, ed è approvato in numerosi stati europei.

Può essere fornito con numerose tipologie di protezione alla corrosione: galvanizzato, con rivestimento in resina epossidica, colorato.

Per applicazioni speciali sono disponibili classi di acciaio differenti.

#### Economic solutions for reinforcement

SAS 500 reinforcing thread bar coupling system replaces many other bar connection systems.

Variable use with continuous and self cleaning thread.

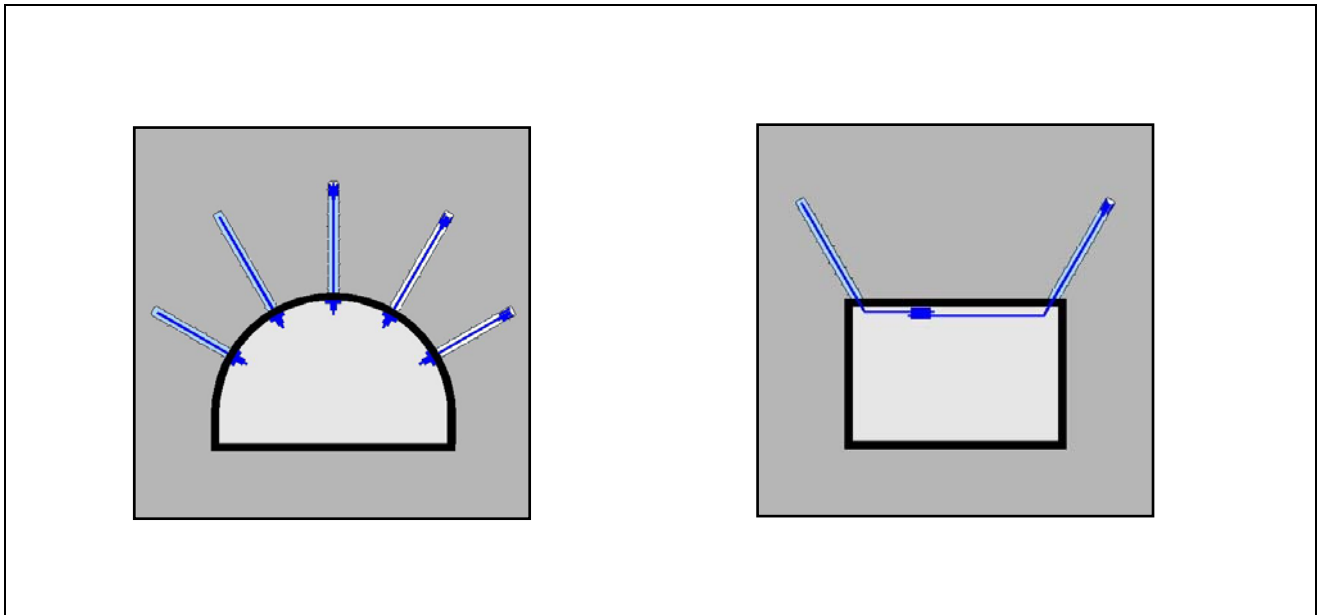
Threaded bar diameter 12mm – 50mm with approval in several European countries.

Usable for all reinforcing requirements.

For applications corresponding steel work different corrosion protection systems are available: galvanized, hot dip galvanized, epoxy coated, painted acc. DV-Norm.

For special applications further steel grades available.

**Gallerie, opere in sotterraneo, impianti minerari / Tunnels, underground, mining**



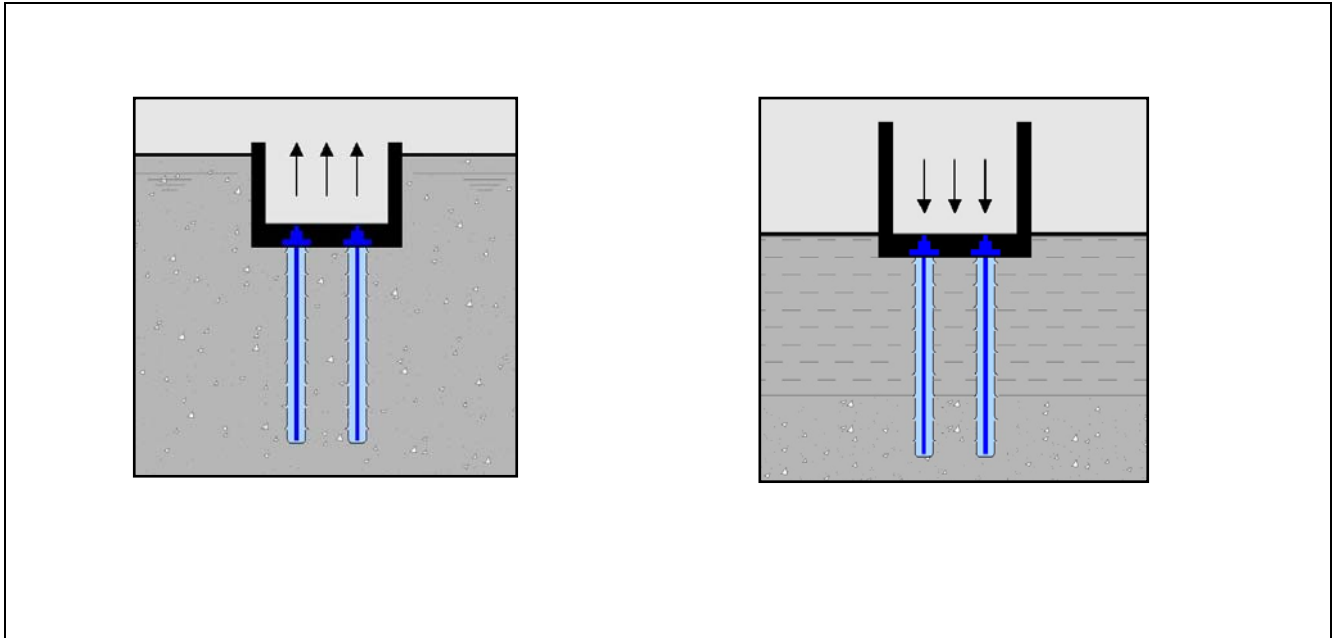
- Ancoraggio di armature
- Stabilizzazione di zone pericolanti, pendii e pareti rocciose particolarmente fratturate, ingressi di gallerie
- La capacità di allungamento dell'acciaio contrasta i movimenti delle armature senza subire rotture o deformazioni
- Possono essere adottati diversi sistemi di ancoraggio: iniezioni di malta cementizia, resine artificiali, testa ad espansione

Versatili accessori speciali: ad es. per supporti di funivie e per binari e/o rotaie da gru.

- Fixing of steel armouring
- Stabilizations of defects zones, slopes and cliffs particularly fractured, entrances of tunnels
- Steel's elongation capacity contrasts the movements of armor without being broken or deformed
- Different anchor systems may be adopted: injections of cement mortar, artificial resins, expansive head

Special versatile accessories: for example for cableways supports of cable cars, binary or rails for crane.

## Strutture di fondazione / Foundation structures



### In terreni coerenti ed incoerenti come:

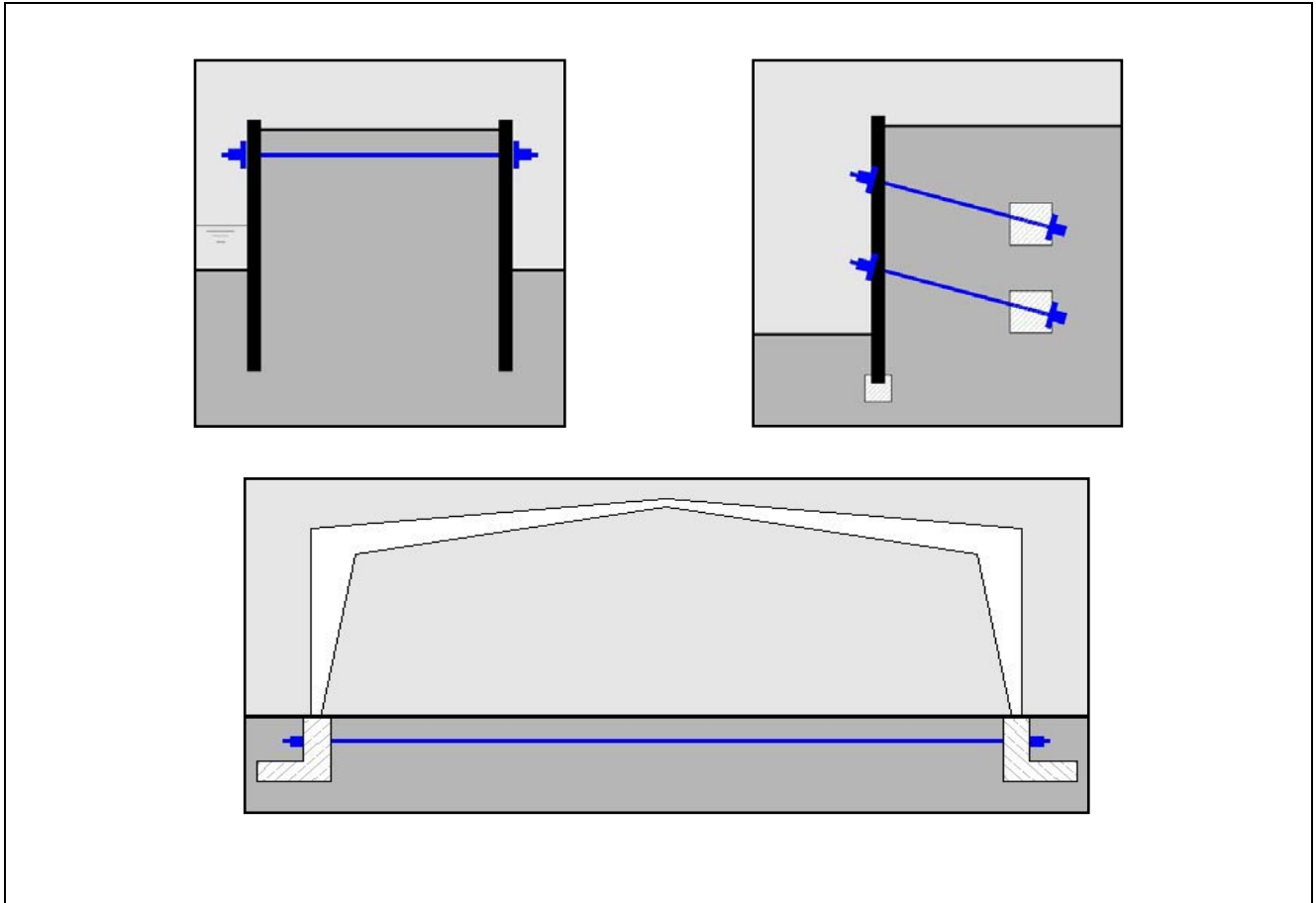
- Fondazioni, per trasferire le sollecitazioni dovute al carico della struttura
- Ancoraggio per la stabilizzazione d'opere soggette a sottospinta idrostatica, es. in falda acquifera (Sollecitazione dovuta a trazione)
- Ancoraggi temporanei, tempo d'utilizzo non superiore ai due anni con protezione anticorrosiva di tipo semplice. Ancoraggi permanenti, tempo d'utilizzo superiore ai due anni con doppia protezione anticorrosiva
- Iniettati per tutta la lunghezza del foro

### In coherent and incoherent grounds as:

- Foundations, to transfer the stresses due to the load of the structure
- Anchoring for the stabilization of structures subject to hydrostatic thrust, es. in aquifer (severe stress due to traction)
- Temporary anchors, with time of use not exceeding two years with simple anticorrosion protection. Permanent anchors, time of use for more than two years with double anticorrosion protection
- Hole injection for the entire length

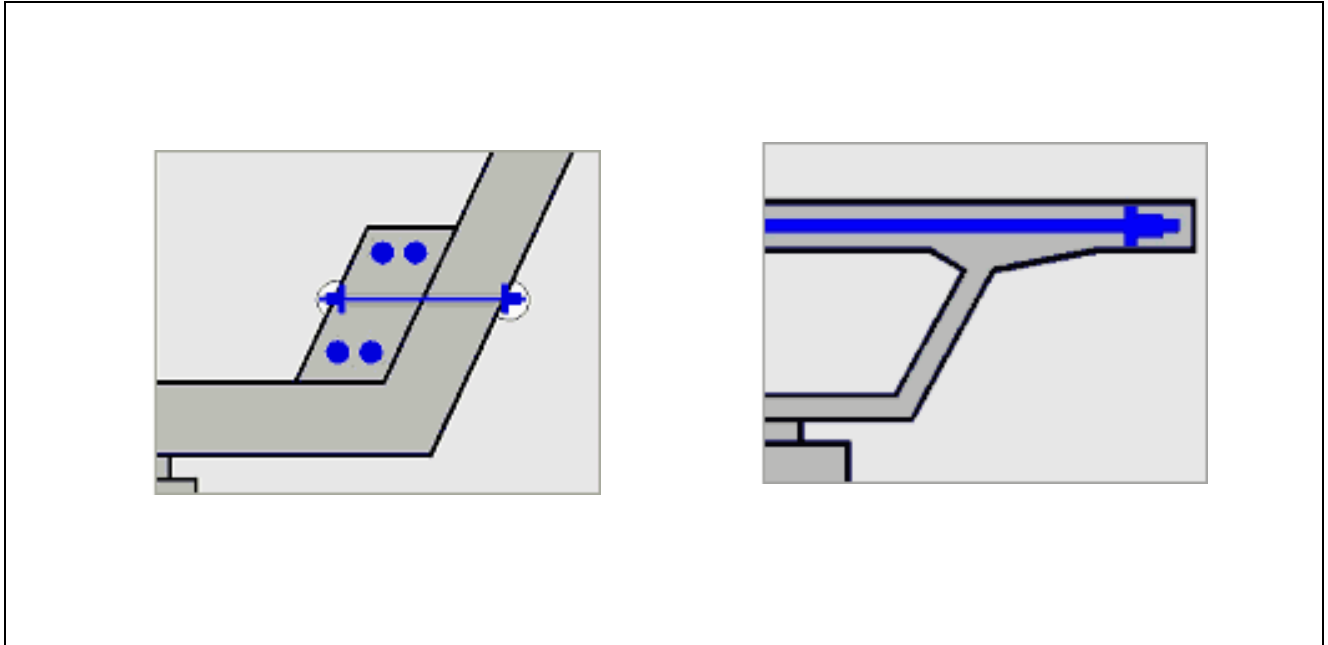


## Ancoraggio di strutture / Structure anchoring



- Ancoraggio di strutture di ritenuta tipo palancole
- Retro ancoraggio di pareti di scavi di fondazione mediante dispositivo tipo "blocco fondale e/o d'ancoraggio"
- Tiranti per geotecnica
- Consolidamento di edifici
- Anchoring of retaining structures for embankments
- Back anchorages of walls for foundations excavations by device type "massive block and/or anchorage"
- Ground anchors for geotechnic
- Buildings consolidation

## *Postensione di strutture in calcestruzzo / Concrete structure postensioning*



Barre filettate con diametri compresi tra 18 e 75 mm, con caratteristiche prestazionali molto elevate (da 255kN a 4572kN).

- Costruzioni in calcestruzzo armato precompresso
- Rinforzo di edifici
- Supporti temporanei
- Ancoraggi temporanei o permanenti, con differenti tipi di rivestimento e protezione alla corrosione.

Threaded bars, with diameters ranging between 18 and 75 mm, with very high performances (from 255kN to 4572kN).

- Prestressed concrete structures
- Rehabilitation of buildings
- Temporary supports
- Temporary or permanent anchorages, with different type of coating and protection against corrosion.

## Y1050 – Barre da precompressione / Post-tensioning bars

**Y 1050** Ø 18-47mm

**Y 1035** Ø 57-75mm

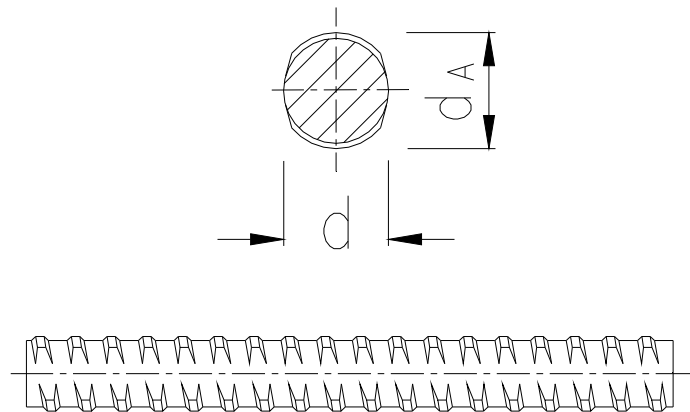
**barre a filettatura continua**

destrorsa, laminata a caldo

**continuous thread bars**

right hand, hot rolled

Ø mm	Articolo / article
18	180WR
26,5	265WR
32	320WR
36	360WR
40	400WR
47	470WR
57	570WR
65	650WR
75	750WR



d Ø [mm]	18	26,5	32	36	40	47	57	65	75	
d <sub>A</sub> [mm]	21	31	37	42	46	53	64	72	82	
c [mm]	8	13	16	18	20	21	21	21	24	
f <sub>y</sub> / f <sub>pk</sub> / A <sub>10</sub> <sup>1)</sup>	950 N/mm <sup>2</sup> / 1050 N/mm <sup>2</sup> / ≥ 7 %						835N/mm <sup>2</sup> /1035 N/mm <sup>2</sup> / ≥7%			
F <sub>y/02</sub> (F <sub>pk</sub> ) [kN]	230	525	760	960	1190	1650	2155	2780	3690	
F <sub>pk</sub> [kN]	255	580	850	1070	1320	1820	2671	3447	4572	
A [mm <sup>2</sup> ]	241	551	804	1020	1257	1735	2581	3331	4418	
G [kg/m]	1,96	4,48	6,53	8,27	10,21	14,10	20,95	27,10	35,90	

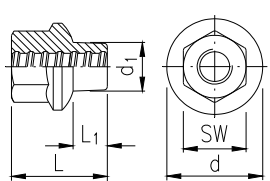
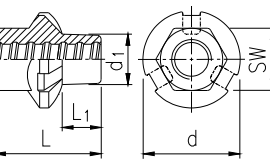
f<sub>pk</sub> = tensione di snervamento caratteristica / *characteristic yielding strength*

f<sub>ptk</sub> = tensione di rottura caratteristica / *characteristic ultimate strength*

F<sub>py</sub> = carico di snervamento minimo / *minimum yielding strength*

F<sub>pt</sub> = carico di rottura minimo / *minimum ultimate strength*

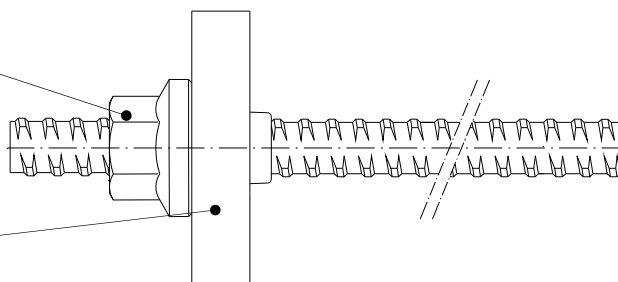
A<sub>10</sub> = allungamento e rottura su base 10 diametri / *ultimate elongation evaluated on 10 diameters*

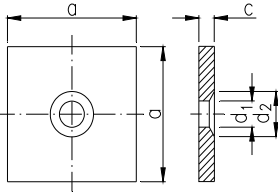
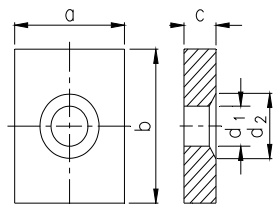
<b>SAS1050</b> <b>Accessori /</b> <b>Accessories</b>	Ø [mm]	18	26,5	32	36	40	47	57	65	75
<b>WR 2801 - Ø</b> <b>dado a calotta,</b> <b>dinamico, 30°</b> <b>conic nut, dynamic,</b> <b>30°</b> 	<b>SW</b> [mm]	32	46	55	60	70	80	-	-	-
	<b>L</b> [mm]	55	80	98	108	125	145	-	-	-
	<b>d</b> [mm]	50	70	86	90	100	120	-	-	-
	<b>d<sub>1</sub></b> [mm]	26	38	47	52	58	68	-	-	-
	<b>L<sub>1</sub></b> [mm]	20	30	40	45	50	58	-	-	-
	<b>G</b> [kg]	0,40	0,77	1,40	1,60	2,55	4,05	-	-	-
	<b>WR 2899 - Ø</b> <b>dado ad iniezione,</b> <b>dinamico, 30°</b> <b>injection nut, dynamic,</b> <b>30°</b> 	<b>SW</b> [mm]	32	46	55	60	70	80	-	-
<b>L</b> [mm]		55	80	98	108	125	145	-	-	-
<b>d</b> [mm]		50	70	86	90	100	120	-	-	-
<b>d<sub>1</sub></b> [mm]		26	38	47	52	58	68	-	-	-
<b>L<sub>1</sub></b> [mm]		20	30	40	45	50	58	-	-	-
<b>G</b> [kg]		0,35	0,75	1,30	1,50	2,45	3,90	-	-	-

*Esempio di montaggio / Assembly example*

**WR 2801 - Ø**  
**dado a calotta, 30°**  
**conic nut, 30°**

**WR 2811 - Ø**  
**piastra d'ancoraggio,**  
**quadrata, 30°**  
**anchorplate, square, 30°**

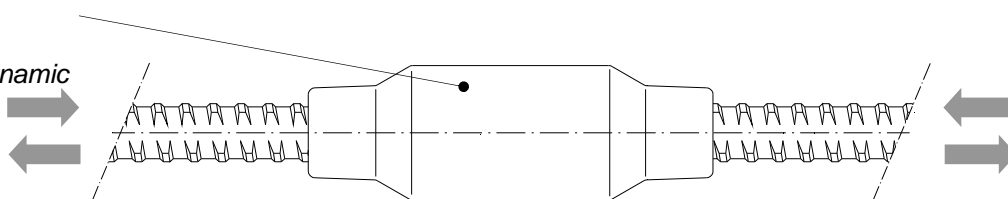


<b>SAS1050 Accessori / Accessories</b>	∅ [mm]	18	26,5	32	36	40	47	36	40	47
<b>WR 2811 - ∅ piastra d'ancoraggio, quadrata, 30° anchorplate, square, 30°</b> 	<b>a</b> [mm]	120	140	180	200	220	260	-	-	-
	<b>c</b> [mm]	20	30	35	40	45	50	-	-	-
	<b>d<sub>1</sub></b> [mm]	37	47	56	61	66	75	-	-	-
	<b>d<sub>2</sub></b> [mm]	50	70	86	90	100	120	-	-	-
	<b>G</b> [kg]	2,10	4,20	8,10	11,70	15,40	24,45	-	-	-
<b>WR 2812 - ∅ piastra d'ancoraggio, rettangolare, 30° anchorplate, rectangular, 30°</b> 	<b>a</b> [mm]	100	120	120	150	150	200	-	-	-
	<b>b</b> [mm]	130	150	220	240	290	326	-	-	-
	<b>c</b> [mm]	20	35	50	55	65	50	-	-	-
	<b>d<sub>1</sub></b> [mm]	37	47	56	61	66	75	-	-	-
	<b>d<sub>2</sub></b> [mm]	50	70	86	90	100	120	-	-	-
	<b>G</b> [kg]	1,83	4,50	9,45	14,20	20,20	23,00	-	-	-

### Esempio di montaggio giunzione di barre con manicotto

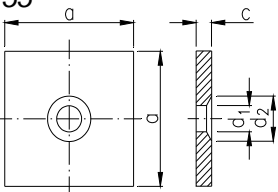
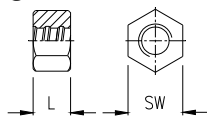
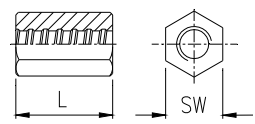
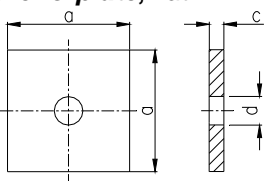
#### Assembly sample of bars junction with coupler

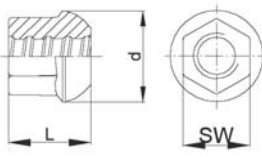
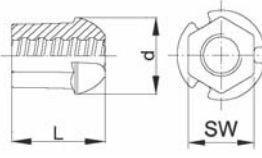
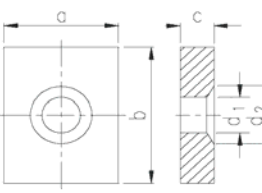
**WR 3803 - ∅<sup>1)</sup>  
manicotto,  
dinamico  
coupler, dynamic**

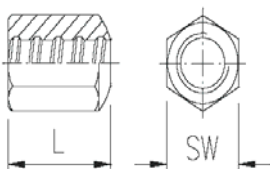
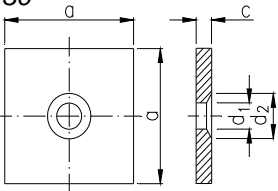
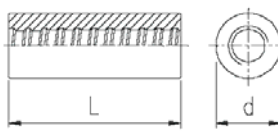


<sup>1)</sup> il manicotto può essere tenuto in posizione tramite controdadi, guaina autorestringente o resina incollante.

<sup>1)</sup> The sleeve can be held in position by fixing nut, auto-tightening sheath or fixing resin.

<b>SAS1050</b> <b>Accessori /</b> <b>Accessories</b>	Ø [mm]	18	26,5	32	36	40	47	57	65	75
<b>WR 2011 - Ø<sup>1)</sup></b> <b>piastra d'ancoraggio,</b> <b>quadrata, 55°</b> <b>anchor plate, square,</b> <b>55°</b> 	<b>a</b> [mm]	-	150	180	200	220	-	-	-	-
	<b>c</b> [mm]	-	35	40	45	45	-	-	-	-
	<b>d<sub>1</sub></b> [mm]	-	39	45	49	54	-	-	-	-
	<b>d<sub>2</sub></b> [mm]	-	72	82	92	100	-	-	-	-
	<b>G</b> [kg]	-	5,60	9,30	12,95	15,60	-	-	-	-
<b>WR 5005 - Ø</b> <b>controdado</b> <b>fixing nut</b> 	<b>SW</b> [mm]	30	36	41	46	50	60	90	90	105
	<b>L</b> [mm]	22	22	22	25	25	30	35	40	50
	<b>G</b> [kg]	0,09	0,10	0,11	0,15	0,16	0,30	1,10	1,25	2,10
<b>WR 2002 - Ø</b> <b>dado d'ancoraggio,</b> <b>piano</b> <b>fixing nut, flat</b> 	<b>SW</b> [mm]	41	46	55	60	70	80	90	100	105
	<b>L</b> [mm]	60	80	90	110	120	140	120	130	145
	<b>G</b> [kg]	0,56	0,75	1,20	1,65	2,65	3,80	4,00	5,30	5,70
<b>WR 2139 - Ø</b> <b>piastra d'ancoraggio,</b> <b>piana</b> <b>anchorplate, flat</b> 	<b>a</b> [mm]	120	150	180	200	220	240	285	325	370
	<b>c</b> [mm]	20	35	40	45	45	55	65	70	80
	<b>d</b> [mm]	25	32	38	45	50	58	70	78	88
	<b>G</b> [kg]	2,20	5,70	9,40	13,05	15,70	23,50	39,50	55,50	82,00

<b>SAS1050</b> <b>Accessori /</b> <b>Accessories</b>	Ø	[mm]	<b>18</b>	<b>26,5</b>	<b>32</b>	<b>36</b>	<b>40</b>	<b>47</b>	<b>57</b>	<b>65</b>	<b>75</b>
<b>WR 2001 - Ø</b> <b>dado a cupola, 55°</b> <b>dome nut, 55°</b> 	<b>SW</b>	[mm]	-	50	60	65	70	80	-	-	-
	<b>L</b>	[mm]	-	75	90	100	115	135	-	-	-
	<b>d</b>	[mm]	-	72	80	90	100	110	-	-	-
	<b>G</b>	[kg]	-	1,13	1,70	2,00	3,00	4,00	-	-	-
<b>WR 2001 - Ø</b> <b>dado a cupola, con fori</b> <b>di iniezione, 55°</b> <b>dome nut, with grout</b> <b>slots, 55°</b> 	<b>SW</b>	[mm]	-	50	60	65	70	80	-	-	-
	<b>L</b>	[mm]	-	75	90	100	115	135	-	-	-
	<b>d</b>	[mm]	-	72	80	90	100	110	-	-	-
	<b>G</b>	[kg]	-	1,05	1,50	2,10	2,70	3,60	-	-	-
<b>WR 2012 - Ø</b> <b>piastra di ancoraggio,</b> <b>rettangolare, 55°</b> <b>anchor plate,</b> <b>rectangular, 55°</b> 	<b>a</b>	[mm]	-	130	140	150	160	-	-	-	-
	<b>b</b>	[mm]	-	150	180	220	250	-	-	-	-
	<b>c</b>	[mm]	-	35	40	50	60	-	-	-	-
	<b>d<sub>1</sub></b>	[mm]	-	39	45	49	54	-	-	-	-
	<b>d<sub>2</sub></b>	[mm]	-	72	82	92	100	-	-	-	-
	<b>G</b>	[kg]	-	4,50	7,07	11,70	17,10	-	-	-	-

<b>SAS1050</b> <b>Accessori /</b> <b>Accessories</b>	Ø	[mm]	<b>18</b>	<b>26,5</b>	<b>32</b>	<b>36</b>	<b>40</b>	<b>47</b>	<b>57</b>	<b>65</b>	<b>75</b>
<b>WR 2963 - Ø</b> <b>dado a cupola, 30°</b> <b>dome nut, 30°</b> 	<b>SW</b>	[mm]	41	46	55	60	70	80	90	100	105
	<b>L</b>	[mm]	60	80	90	110	120	140	120	130	145
	<b>d</b>	[mm]	-	-	-	-	-	-	95	105	114
	<b>G</b>	[kg]	0,53	0,72	1,15	1,60	2,58	3,70	3,95	4,90	5,30
<b>WR 1928 - Ø<sup>1)</sup></b> <b>piastra d'ancoraggio,</b> <b>conica, 30°</b> <b>anchor plate, cone,</b> <b>30°</b> 	<b>a</b>	[mm]	120	150	180	200	220	240	285	325	370
	<b>c</b>	[mm]	20	35	40	45	45	55	65	70	80
	<b>d<sub>1</sub></b>	[mm]	25	32	38	45	50	58	70	78	88
	<b>d<sub>2</sub></b>	[mm]	35	45	50	60	70	80	90	110	120
	<b>G</b>	[kg]	2,18	5,95	9,81	13,55	16,36	23,50	39,30	55,25	82,00
<b>WR 3003 - Ø</b> <b>manicotto, standard</b> <b>coupler, standard</b> 	<b>d</b>	[mm]	36	50	60	68	70	89	95	105	114
	<b>L</b>	[mm]	100	170	200	210	245	280	240	260	290
	<b>G</b>	[kg]	0,80	1,80	3,40	4,40	5,35	7,35	8,20	10,60	12,20



**Su richiesta forniamo le barre filettate in acciaio con i seguenti rivestimenti:  
On request we supply threaded steel bars with the following coating:**

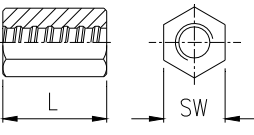
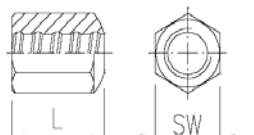
N°	Rivestimento <sup>1)</sup> Coating <sup>1)</sup>	Sigla ID	Normativa di riferimento Reference code	Lunghezza barra Bar length
1	rivestimento epoxy <sup>2) 3)</sup> (previa sabbiatura)	EP	ASTM A 934 / A 934M ASTM A 775 / A 775M	15 m

<sup>1)</sup> zincatura su richiesta / galvanization on request


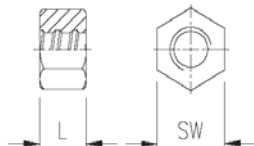
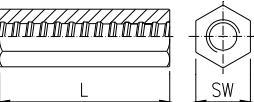
<sup>2)</sup> nel caso la merce venisse danneggiata durante il trasporto Vi forniamo il kit di riparazione su richiesta  
if the goods were damaged during transport we provide the repair kit on request

<sup>3)</sup> l'ordine è vincolato da un numero minimo di barre da rivestire.  
The order must be reported to a minimum numbers of bars to be coated

**Accessori (senza rivestimento) per barre filettate rivestite in epoxy  
Accessories (without coating) for threaded bar with epoxy-coating**

<b>SAS1050</b> Accessori / Accessories	Ø [mm]	18	26,5	32	36	40	47	57	65	75
<b>WR 2002 - Ø EP</b> <b>dado d'ancoraggio,</b> <b>piano</b> <b>fixing nut, flat</b> 	<b>SW</b> [mm]	41	46	55	60	70	80	-	-	-
	<b>L</b> [mm]	70	90	100	120	130	150	-	-	-
	<b>G</b> [kg]	0,64	0,83	1,30	1,80	3,00	4,48	-	-	-
<b>WR 2963 - Ø EP</b> <b>dado d'ancoraggio</b> <b>bombato, 30°</b> <b>fixing rounded nut,</b> <b>30°</b> 	<b>SW</b> [mm]	41	46	55	60	70	80	-	-	-
	<b>L</b> [mm]	70	90	100	120	130	150	-	-	-
	<b>d</b> [mm]	-	-	-	-	-	-	-	-	-
	<b>G</b> [kg]	0,61	0,80	1,25	1,75	2,93	4,38	-	-	-

**Accessori (senza rivestimento) per barre filettate rivestite in epoxy**  
**Accessories (without coating) for threaded bar with epoxy-coating**

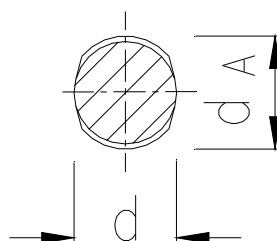
<b>SAS1050</b> Accessori / Accessories	Ø	[mm]	<b>18</b>	<b>26,5</b>	<b>32</b>	<b>36</b>	<b>40</b>	<b>47</b>	<b>57</b>	<b>65</b>	<b>75</b>
<b>WR 3003 - Ø EP</b> <b>manicotto, standard</b> <b>coupler, standard</b> 	<b>L</b>	[mm]	36	52	65	70	76	89	-	-	-
	<b>d</b>	[mm]	120	185	220	240	265	310	-	-	-
	<b>G</b>	[kg]	0,72	2,28	4,34	5,33	6,85	10,88	-	-	-
<b>WR 5005 - Ø EP</b> <b>dado d'ancoraggio</b> <b>fixing nut</b> 	<b>SW</b>	[mm]	30	36	41	46	50	60	-	-	-
	<b>L</b>	[mm]	22	22	22	25	25	30	-	-	-
	<b>d</b>	[mm]	-	-	-	-	-	-	-	-	-
	<b>G</b>	[kg]	0,09	0,10	0,11	0,15	0,16	0,30	-	-	-
<b>WR 3009 - Ø EP</b> <b>manicotto,</b> <b>esagonale</b> <b>coupler, hexagonal</b> 	<b>L</b>	[mm]	41	55	65	70	70	-	-	-	-
	<b>d</b>	[mm]	120	185	220	240	265	-	-	-	-
	<b>G</b>	[kg]	1,10	2,83	4,65	5,65	7,29	-	-	-	-

**B670 – Barre per opere geotecniche - Costruzione di gallerie  
/ Geotechnical bars – Tunnels construction**

# SAS 670

**Barre a filettatura continua**  
destrorsa, laminata a caldo  
**continuous thread steel bars**  
right hand, hot rolled

Ø mm	Articolo / article
18	180AT
22	220AT
25	250AT
28	280AT
30	300AT
35	350AT
43	430AT
57,5	575AT
63,5	635AT
75	750AT



d Ø [mm]		18	22	25	28	30	35	43	57,5	63,5	75
d <sub>A</sub>	[mm]	21	25	28	32	34	40	48	63	70	82
c	[mm]	8	8	10	11	11	14	17	20	21	24
f <sub>y</sub> / f <sub>t</sub> / A <sub>10</sub> <sup>1)</sup>		670 N/mm <sup>2</sup> / 800 N/mm <sup>2</sup> / ≥ 10%									
F <sub>y</sub> (F <sub>0,2</sub> )	[kN]	170	250	330	410	475	640	980	1740	2120	2960
F <sub>t</sub>	[kN]	195	300	390	490	565	770	1170	2080	2540	3535
A	[mm <sup>2</sup> ]	250	375	491	616	707	962	1466	2597	3167	4418
G	[kg/m]	1,96	2,94	3,85	4,83	5,55	7,55	11,51	20,38	24,86	34,68

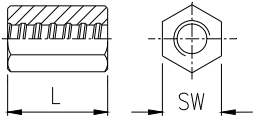
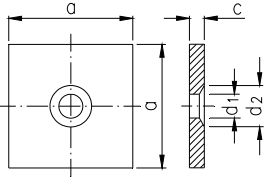
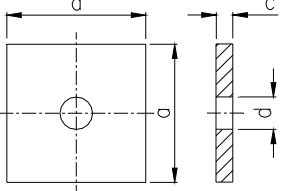
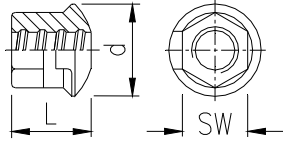
f<sub>pyk</sub> = tensione di snervamento caratteristica / *characteristic yielding strength*

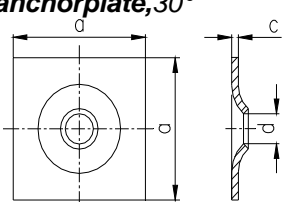
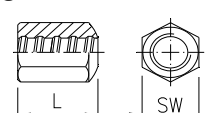
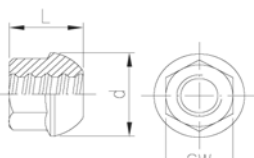
f<sub>ptk</sub> = tensione di rottura caratteristica / *characteristic ultimate strength*

F<sub>py</sub> = carico di snervamento minimo / *minimum yielding strength*

F<sub>pt</sub> = carico di rottura minimo / *minimum ultimate strength*

A<sub>10</sub> = allungamento e rottura su base 10 diametri / *ultimate elongation evaluated on 10 diameters*

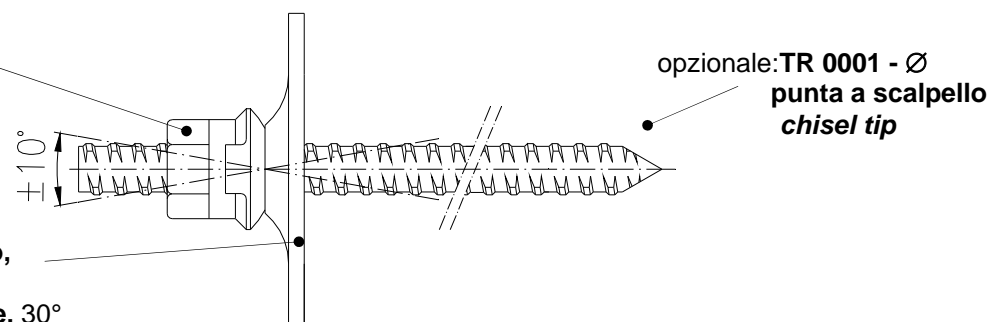
<b>SAS670</b> <b>Accessori /</b> <b>Accessories</b>	Ø [mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 2002 - Ø</b> <b>dado d'ancoraggio, piano</b> <b>fixing nut, flat</b> 	<b>SW</b> [mm]	36	41	46	50	55	65	80	90	100	100
	<b>d</b> [mm]	-	-	-	-	-	-	-	102	104	108
	<b>L</b> [mm]	45	50	55	60	65	70	90	120	145	130
	<b>G</b> [kg]	0,30	0,35	0,50	0,65	0,85	1,45	2,70	4,60	7,30	4,60
<b>TR 2011 - Ø</b> <b>piastra d'ancoraggio,</b> <b>conica, 55°</b> <b>anchorplate, conic, 55°</b> 	<b>a</b> [mm]	110	110	125	135	145	170	210	275	300	-
	<b>c</b> [mm]	25	30	30	35	35	40	50	60	65	-
	<b>d1</b> [mm]	27	32	35	40	40	47	58	75	82	-
	<b>d2</b> [mm]	39	47	53	59	63	73	90	119	131	-
	<b>G</b> [kg]	1,84	2,62	3,40	4,50	5,30	8,30	15,90	32,70	42,00	-
<b>TR 2139 - Ø</b> <b>piastra d'ancoraggio,</b> <b>piana</b> <b>anchorplate, flat</b> 	<b>a</b> [mm]	100	110	125	135	145	170	210	275	300	325
	<b>c</b> [mm]	25	30	30	35	35	40	50	60	65	70
	<b>d</b> [mm]	27	32	35	40	40	47	58	58	82	88
	<b>G</b> [kg]	1,85	2,66	3,45	4,66	5,43	8,83	16,27	33,54	43,23	54,70
<b>TR 2944 - Ø</b> <b>dado a calotta, 30°</b> <b>rounded nut, 30°</b> 	<b>SW</b> [mm]	30	36	41	46	46	-	-	-	-	-
	<b>L</b> [mm]	35	40	50	60	60	-	-	-	-	-
	<b>d</b> [mm]	46	51	58	62	62	-	-	-	-	-
	<b>G</b> [kg]	0,20	0,30	0,45	0,65	0,65	-	-	-	-	-

<b>SAS670 Accessori / Accessories</b>	$\varnothing$ [mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 2132 - <math>\varnothing</math> piastra d'ancoraggio bombata, 30° rounded anchorplate, 30°</b> 	<b>a</b> [mm]	150	150	200	200	200	-	-	-	-	-
	<b>c</b> [mm]	10	10	10	12	12	-	-	-	-	-
	<b>d</b> [mm]	26	34	34	40	40	-	-	-	-	-
	<b>G</b> [kg]	1,70	1,75	3,10	3,68	3,68	-	-	-	-	-
<b>TR 2963 - <math>\varnothing</math> dado d'ancoraggio bombato, saldabile, 30° fixing rounded nut, 30°</b> 	<b>SW</b> [mm]	-	-	-	-	55	65	80	90	100	100
	<b>L</b> [mm]	-	-	-	-	65	70	90	120	145	130
	<b>G</b> [kg]	-	-	-	-	0,90	1,36	2,60	4,40	7,00	4,55
<b>TR 2001 - <math>\varnothing</math> Dado a cupola, 55° domed nut, 55°</b> 	<b>SW</b> [mm]	32	36	41	46	50	60	70	90	100	-
	<b>L</b> [mm]	35	45	50	55	60	70	85	115	125	-
	<b>d</b> [mm]	43	53	59	67	71	83	102	137	151	-
	<b>G</b> [kg]	0,16	0,27	0,39	0,54	0,66	1,10	1,90	4,90	6,90	-

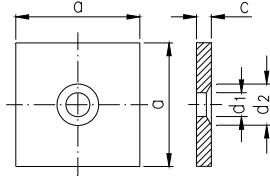
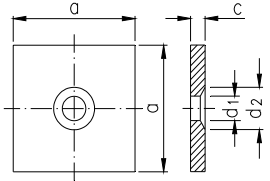
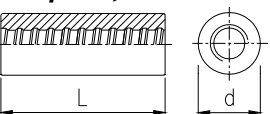
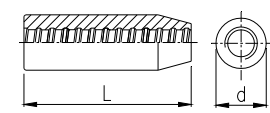
### **Esempio di montaggio - chiodo / Assembly sample - nail**

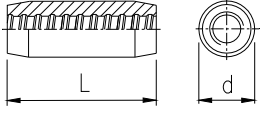
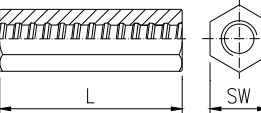
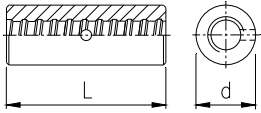
**TR 2944 -  $\varnothing$ <sup>1)</sup>  
dado a calotta, 30°  
Rounded nut, 30°**

**TR 2132 -  $\varnothing$ <sup>1)</sup>  
piastra d'ancoraggio,  
bombata, 30°  
rounded anchorplate, 30°**



<sup>1)</sup> massima deviazione amessa tra dado e piastra  $\pm 10^\circ$  / maximum allowable deviation between nut and anchorplate  $\pm 10^\circ$

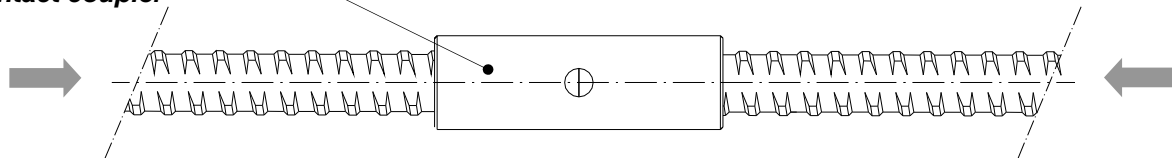
<b>SAS670</b> <b>Accessori /</b> <b>Accessories</b>	Ø	[mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 1928 - Ø</b> <b>piastra d'ancoraggio,</b> <b>conica, 30°</b> <b>conic anchorplate, 30°</b> 	<b>a</b>	[mm]	100	110	125	135	145	170	210	275	300	325
	<b>c</b>	[mm]	25	30	30	35	35	40	50	60	65	70
	<b>d<sub>1</sub></b>	[mm]	25	30	33	40	40	47	58	70	78	88
	<b>d<sub>2</sub></b>	[mm]	35	40	45	50	50	60	75	90	100	120
	<b>G</b>	[kg]	1,86	2,68	3,47	4,65	5,42	8,51	16,24	33,75	43,41	54,52
<b>TR 2928 - Ø</b> <b>piastra d'ancoraggio,</b> <b>grande, 30°</b> <b>big anchorplate, 30°</b> 	<b>a</b>	[mm]	-	-	200	200	200	-	-	-	-	-
	<b>c</b>	[mm]	-	-	20	20	20	-	-	-	-	-
	<b>d<sub>1</sub></b>	[mm]	-	-	33	40	40	-	-	-	-	-
	<b>d<sub>2</sub></b>	[mm]	-	-	45	50	50	-	-	-	-	-
	<b>G</b>	[kg]	-	-	6,15	6,10	6,10	-	-	-	-	-
<b>TR 3003 - Ø</b> <b>manicotto, standard</b> <b>couplers, standard</b> 	<b>d</b>	[mm]	36	40	45	50	55	65	80	102	114	108
	<b>L</b>	[mm]	100	100	120	140	150	170	200	250	300	260
	<b>G</b>	[kg]	0,58	0,70	0,98	1,40	1,85	3,10	5,50	10,00	16,50	9,50
<b>TR 3901 - Ø</b> <b>manicotto, smussato</b> <b>coupler, beveled</b> 	<b>d</b>	[mm]	36	40	45	50	55	65	-	-	-	-
	<b>L</b>	[mm]	100	110	120	140	150	170	-	-	-	-
	<b>G</b>	[kg]	0,55	0,65	0,92	1,40	1,80	3,05	-	-	-	-

<b>SAS670 Accessori / Accessories</b>	$\varnothing$ [mm]	<b>18</b>	<b>22</b>	<b>25</b>	<b>28</b>	<b>30</b>	<b>35</b>	<b>43</b>	<b>57,5</b>	<b>63,5</b>	<b>75</b>
<b>TR 3927 - <math>\varnothing</math> Manicotto, temperato Coupler, tempered</b> 	<b>d</b> [mm]	-	-	-	-	-	56	65	85	95	-
	<b>L</b> [mm]	-	-	-	-	-	150	170	220	240	-
	<b>G</b> [kg]	-	-	-	-	-	2,10	3,40	5,00	8,30	-
<b>TR 3009 - <math>\varnothing</math> manicotto esagonale Coupler, exagonal</b> 	<b>SW</b> [mm]	36	41	46	50	55	60	80	-	-	-
	<b>L</b> [mm]	120	135	145	170	180	205	235	-	-	-
	<b>G</b> [kg]	0,80	1,11	1,49	2,03	2,65	3,41	7,45	-	-	-
<b>TR 3006 - <math>\varnothing</math> manicotto di contatto contact coupler</b> 	<b>d</b> [mm]	-	32	40	45	45	50	65	80	90	102
	<b>L</b> [mm]	-	75	80	90	90	120	160	180	200	230
	<b>G</b> [kg]	-	0,25	0,47	0,67	0,60	1,00	2,35	4,10	4,80	6,63

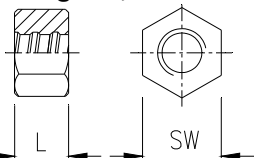
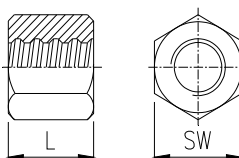
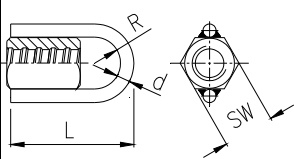
**Esempio di montaggio manicotto di contatto per micropali (non necessità di controdadi di bloccaggio)**

*Assembly sample for contact coupler for micropiles (no need for locking nut)*

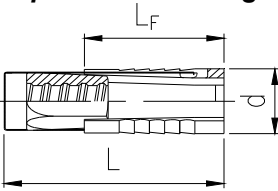
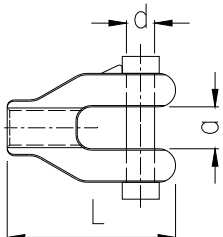

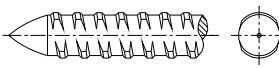
**TR 3006 -  $\varnothing$   
manicotto di contatto  
contact coupler**

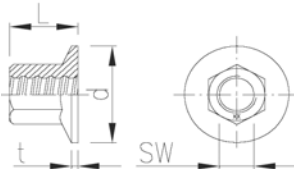
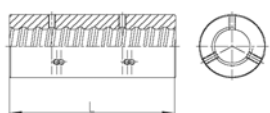
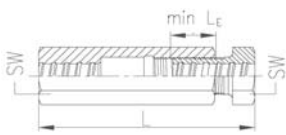


**foro per il controllo del posizionamento  
hole for positioning control**

<b>SAS670 Accessori / Accessories</b>	Ø [mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 2040 - Ø controdado, corto fixing nut, short</b> 	<b>SW</b> [mm]	30	36	41	46	50	55	70	90	100	100
	<b>L</b> [mm]	22	22	22	30	30	40	50	60	70	80
	<b>d</b> [mm]	-	-	-	-	-	-	-	102	114	108
	<b>G</b> [kg]	0,09	0,12	0,16	0,26	0,26	0,50	1,05	2,20	3,25	2,50
<b>TR 2003 - Ø controdado, lungo fixing nut, long</b> 	<b>SW</b> [mm]	30	36	41	46	50	55	70	90	100	100
	<b>L</b> [mm]	40	45	50	55	60	65	80	100	115	120
	<b>d</b> [mm]	-	-	-	-	-	-	-	102	114	108
	<b>G</b> [kg]	0,16	0,25	0,37	0,50	0,67	0,80	1,70	3,60	5,10	4,20
<b>TR 2927 - Ø dado con occhiello nut with eyelet</b> 	<b>SW</b> [mm]	36	41	46	50	55	-	-	-	-	-
	<b>L</b> [mm]	85	90	105	110	115	-	-	-	-	-
	<b>d</b> [mm]	16	16	16	16	16	-	-	-	-	-
	<b>R</b> [mm]	18	20	23	25	27	-	-	-	-	-
	<b>G</b> [kg]	0,35	0,50	0,65	0,80	1,05	-	-	-	-	-



<b>SAS670 Accessori / Accessories</b>		Ø [mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 2136 - Ø ancoraggio a espansione expansive anchorage</b> 	<b>d</b> [mm]	39	49	49	59	59	-	-	-	-	-	-
	<b>L</b> [mm]	110	120	120	150	150	-	-	-	-	-	-
	<b>L<sub>F</sub></b> [mm]	70	70	70	90	90	-	-	-	-	-	-
	<b>G</b> [kg]	0,43	0,65	0,62	1,09	1,00	-	-	-	-	-	-
<b>TR 2926 - Ø testa a forcella (grillo) fork anchor</b> 	<b>a</b> [mm]	-	70	70	-	-	-	-	-	-	-	-
	<b>d</b> [mm]	-	40	40	-	-	-	-	-	-	-	-
	<b>L</b> [mm]	-	120	120	-	-	-	-	-	-	-	-
	<b>G</b> [kg]	-	1,15	1,10	-	-	-	-	-	-	-	-
<b>TR 9001 - Ø punta a scalpello chisel tip</b> 	<b>&lt;</b> [°]	60	60	60	60	60	-	-	-	-	-	-
<b>TR 9002 - Ø punta a matita point tip</b> 	<b>&lt;</b> [°]	60	60	60	60	60	-	-	-	-	-	-

<b>SAS670</b> <b>Accessori /</b> <b>Accessories</b>	$\varnothing$ [mm]	<b>18</b>	<b>22</b>	<b>25</b>	<b>28</b>	<b>30</b>	<b>35</b>	<b>43</b>	<b>57,5</b>	<b>63,5</b>	<b>75</b>
<b>TR 2073 - <math>\varnothing</math></b> <b>dado di fissaggio</b> <b>anchor piece</b> 	<b>SW</b> [mm]	32	36	41	46	50	60	70	90	100	-
	<b>L</b> [mm]	35	45	50	55	60	70	85	115	125	-
	<b>d</b> [mm]	55	65	75	85	90	105	130	175	190	-
	<b>G</b> [kg]	0,28	0,42	0,60	0,82	1,00	1,82	2,64	6,80	7,47	-
<b>TR 3020 - <math>\varnothing</math></b> <b>accoppiatore con viti</b> <b>coupler with set</b> <b>screws</b> 	<b>d</b> [mm]	36	40	45	50	55	65	80	102	114	-
	<b>L</b> [mm]	100	110	120	140	150	170	200	250	300	-
	<b>G</b> [kg]	0,58	0,70	0,98	1,40	1,85	3,10	5,50	10,0	16,5	-
<b>TR 3105 - <math>\varnothing</math></b> <b>tenditore</b> <b>turnbuckle</b> 	<b>SW</b> [mm]	41	46	50	60	65	80	90	100	100	110
	<b>L</b> [mm]	175	190	205	230	260	275	325	395	405	405
	<b>Le</b> [mm]	30	35	40	40	50	55	65	75	75	80
	<b>G</b> [kg]	-	-	-	-	-	-	13,9	21,7	23,4	21,7
<b>TR 9003 - <math>\varnothing</math></b> <b>punta inclinata</b> <b>saw tip</b>											
	<b>&lt; [°]</b>	45	45	45	45	45	-	-	-	-	-

Su Vostra richiesta forniamo le barre filettate in acciaio con i seguenti rivestimenti:  
 At your request we provide threaded steel bars with the following coatings:

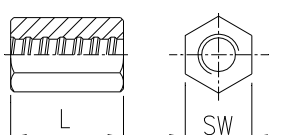
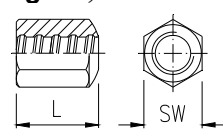
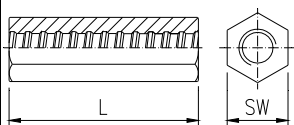
N°	Rivestimento / Coating	Sigla / ID	spessore / thickness	Normativa di riferimento / Reference code	lunghezza barra / bar length
1	zincatura a spruzzo / spray galvanization	GV	$\mu = 8^{\pm 2\mu}$	DIN 50961	su richiesta / on request
2	zincatura a caldo / hot galvanization	FV	$\mu = 100^{\pm 20\mu}$	DIN EN ISO 1461	su richiesta / on request
3	rivestimento epoxy <sup>1)</sup> 2) epoxy coating <sup>1)2)</sup>	EP	$\mu = 200^{\pm 50\mu}$	ASTM A 934 / A 934M ASTM A 775 / A 775M	15 mt

<sup>1)</sup> nel caso la merce venisse danneggiata durante il trasporto Vi forniamo il kit di riparazione su richiesta.  
 if the goods were damaged during transport we provide the repair kit on request

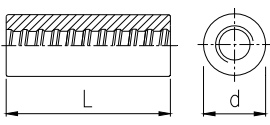
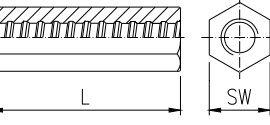
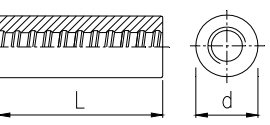
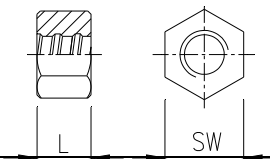
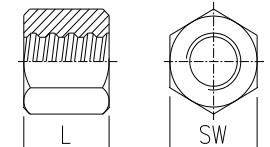
<sup>2)</sup> l'ordine è vincolato da un numero minimo di barre da rivestire.

The order must be reported to a minimum numbers of bars to be coated

**Accessori (senza rivestimento) per barre filettate rivestite in epoxy**  
**Accessories (without cover) for threaded epoxy coated bars**

<b>SAS670</b> <b>Accessori /</b> <b>Accessories EP</b>	Ø [mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 2002 - Ø EP</b> <b>dado d'ancoraggio,</b> <b>piano</b> <b>fixing nut, flat</b> 	<b>SW</b> [mm]	36	41	46	50	55	65	80	90	100	100
	<b>L</b> [mm]	55	60	70	75	80	85	105	140	140	-
	<b>G</b> [kg]	0,37	0,49	0,72	0,90	1,18	1,77	3,30	5,60	8,60	-
<b>TR 2963 - Ø EP</b> <b>dado d'ancoraggio,</b> <b>bombato, 30°</b> <b>fixing nut, rounded</b> 	<b>SW</b> [mm]	36	41	46	50	55	65	80	90	100	-
	<b>L</b> [mm]	55	60	70	75	80	85	105	140	140	-
	<b>G</b> [kg]	0,38	0,43	0,68	0,85	1,12	1,65	1,70	5,50	6,90	-
<b>TR 3009 - Ø EP</b> <b>manicotto esagonale</b> <b>exagonal coupler</b> 	<b>SW</b> [mm]	36	41	46	50	55	65	-	-	-	-
	<b>L</b> [mm]	115	125	150	160	165	190	-	-	-	-
	<b>G</b> [kg]	0,77	1,02	1,55	1,91	2,43	3,96	-	-	-	-

**Accessori (senza rivestimento) per barre filettate rivestite in epoxy**  
**Accessories (without cover) for threaded epoxy coated bars**

<b>SAS670</b> <b>Accessori /</b> <b>Accessories EP</b>	Ø [mm]	18	22	25	28	30	35	43	57,5	63,5	75
<b>TR 3003 - Ø EP</b> <b>Accoppiatore,</b> <b>standard</b> <b>coupler, standard</b> 	<b>d</b> [mm]	36	40	45	50	55	65	80	102	108	-
	<b>L</b> [mm]	115	125	150	160	165	190	225	275	285	-
	<b>G</b> [kg]	0,65	0,81	1,24	1,63	2,07	3,41	6,14	11,9	13,2	-
<b>TR 3009 - Ø EP</b> <b>Manicotto a contatto</b> <b>contact coupler</b> 	<b>SW</b> [mm]	36	41	46	50	55	65	-	-	-	-
	<b>L</b> [mm]	115	125	150	160	165	190	-	-	-	-
	<b>G</b> [kg]	0,77	1,02	1,55	1,91	2,43	3,96	-	-	-	-
<b>TR 3006 - Ø EP</b> <b>Manicotto a contatto</b> <b>contact coupler</b> 	<b>SW</b> [mm]	-	32	40	45	45	50	65	80	90	-
	<b>L</b> [mm]	-	75	80	90	90	120	160	180	200	-
	<b>G</b> [kg]	-	0,25	0,47	0,67	0,80	1,00	2,35	4,10	4,80	-
<b>TR 2040 - Ø EP</b> <b>Dado di chiusura,</b> <b>corto</b> <b>lock nut, short</b> 	<b>SW</b> [mm]	30	36	41	46	50	55	70	90	100	-
	<b>L</b> [mm]	30	30	30	40	40	65	80	100	115	-
	<b>G</b> [kg]	0,11	0,16	0,22	0,25	0,33	0,81	1,69	3,80	5,00	-
<b>TR 2003 - Ø EP</b> <b>Dado di chiusura,</b> <b>lungo</b> <b>lock nut, long</b> 	<b>SW</b> [mm]	-	-	-	-	-	55	70	90	100	-
	<b>L</b> [mm]	-	-	-	-	-	80	100	120	140	-
	<b>G</b> [kg]	-	-	-	-	-	1,00	2,12	4,70	6,20	-

**B500 – Barre per opere geotecniche ed armature per c.a.**  
**/ Bars for geotechnical works and concrete reinforcement**

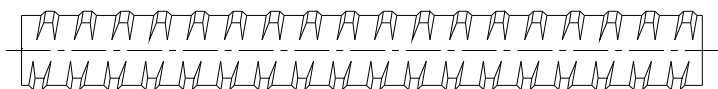
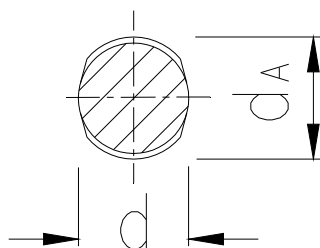
**SAS 500** (BSt 500 S) Ø 12–50mm

**SAS 555** (S 555/700) Ø 63,5mm

**barre a filettatura continua**  
 sinistrorso, laminate a caldo

**continuous threaded bar**  
 left hand thread - hot rolled, ribbed

Ø mm	Articolo / article
12	120GL
14	140GL
16	160GL
20	200GL
25	250GL
28	280GL
32	320GL
40	400GL
50	500GL
63,5	635GL



d Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
max d <sub>A</sub> [mm]	14	16	19	23	29	32	36	45	56	70
c [mm]	7	7,5	8	10	12,5	14	16	20	26	21
f <sub>y</sub> / f <sub>t</sub> / A <sub>gt</sub>	500 N/mm <sup>2</sup> / 550 N/mm <sup>2</sup> / ≥ 6%									555N/mm <sup>2</sup> /700N/mm <sup>2</sup> / ≥ 5%
F <sub>y</sub> (F <sub>0,2</sub> ) [kN]	57	77	100	160	245	310	405	630	980	1760
F <sub>t</sub> [kN]	62	85	110	175	270	340	440	690	1080	2215
A [mm <sup>2</sup> ]	113	154	201	314	491	616	804	1260	1960	3167
G [kg/m]	0,89	1,21	1,58	2,47	3,85	4,83	6,31	9,87	15,40	24,86

f<sub>y</sub> = tensione di snervamento minima / *minimum yielding strength*

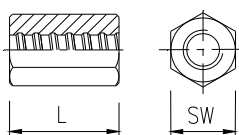
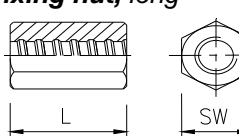
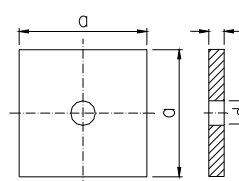
f<sub>t</sub> = tensione di rottura minima / *minimum ultimate strength*

F<sub>y</sub> = carico di snervamento minimo / *minimum yielding load*

F<sub>t</sub> = carico di rottura minimo / *minimum ultimate load*

A<sub>gt</sub> = allungamento percentuale con la massima forza / *percentage total elongation at maximum force*

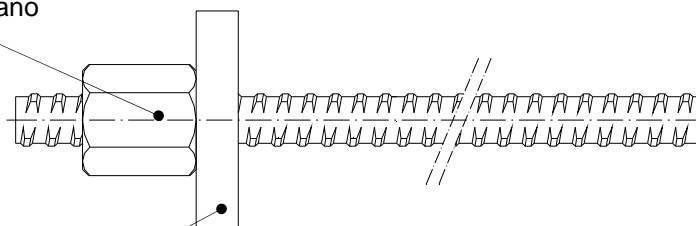
A = area / *area*

SAS500 Accessori / Accessories	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 2002 - Ø</b> <b>dado</b> <b>d'ancoraggio, piano</b> <b>fixing nut, flat</b> 	<b>SW</b> [mm]	22	27	32	36	41	46	55	65	80	100
	<b>L</b> [mm]	25	35	40	45	50	55	60	70	90	115
	<b>d</b> [mm]	-	-	-	-	-	-	-	-	-	108
	<b>G</b> [kg]	0,10	0,15	0,20	0,27	0,35	0,50	0,80	1,20	2,25	4,80
<b>T 2024 - Ø</b> <b>dado</b> <b>d'ancoraggio, lungo</b> <b>fixing nut, long</b> 	<b>SW</b> [mm]	22	27	32	32	41	41	50	60	80	-
	<b>L</b> [mm]	35	45	50	65	75	85	90	100	120	-
	<b>G</b> [kg]	0,15	0,20	0,25	0,25	0,52	0,48	0,90	1,30	3,00	-
<b>T 2139 - Ø</b> <b>piastra d'ancoraggio,</b> <b>piana</b> <b>anchorplate, flat</b> 	<b>a</b> [mm]	50	50	50	70	70	100	120	150	190	245
	<b>c</b> [mm]	8	8	8	10	10	12	20	30	45	50
	<b>d</b> [mm]	16	18	20	25	30	33	40	47	58	70
	<b>G</b> [kg]	0,15	0,15	0,15	0,35	0,35	0,90	2,10	4,20	11,70	22,10

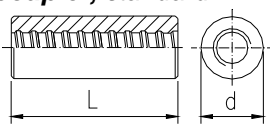
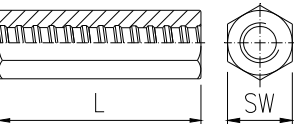
**Esempio di montaggio / Assembly sample:**

**ancoraggio temporaneo / temporary anchorage**

**T 2002 - Ø**  
**dado d'ancoraggio, piano**  
**fixing nut, flat**



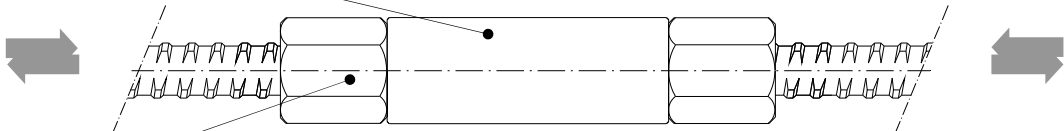
**T 2139 - Ø**  
**piastra d'ancoraggio, piana**  
**anchorplate, flat**

SAS500 Accessori / Accessories	Ø [mm]	12	16	20	25	28	32	40	50	63,5
<b>T 3003 - Ø</b> <b>manicotto, standard</b> <b>coupler, standard</b> 	<b>d</b> [mm]	22	32	36	40	45	52	65	80	102
	<b>L</b> [mm]	60	90	105	115	125	140	160	200	260
	<b>G</b> [kg]	0,12	0,40	0,53	0,62	0,85	1,35	2,35	4,50	9,50
<b>T 3010 - Ø</b> <b>manicotto esagonale,</b> <b>lungo</b> <b>coupler, exagonal, long</b> 	<b>SW</b> [mm]	-	32	32	41	41	50	65	80	-
	<b>L</b> [mm]	-	120	140	160	180	180	210	240	-
	<b>G</b> [kg]	-	0,60	0,65	1,10	1,05	1,75	2,75	6,05	-

**Esempio di montaggio: giunzione di barre con manicotto**  
**Assembly sample – bars junction with coupler.**

**T 3003 - Ø**  
**manicotto, standard**  
**coupler, standard**

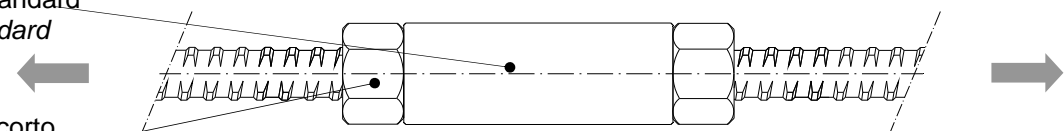
**T 2003 - Ø**  
**controdado, lungo**  
**fixing nut, long**

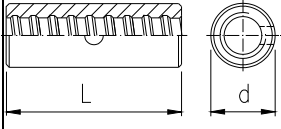
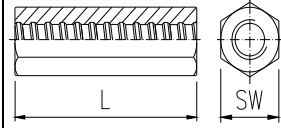
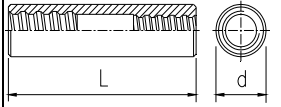


**Esempio di montaggio: giunzione di barre con manicotto**  
**Assembly sample – bars junction with coupler.**

**T 3003 - Ø**  
**manicotto, standard**  
**coupler, standard**

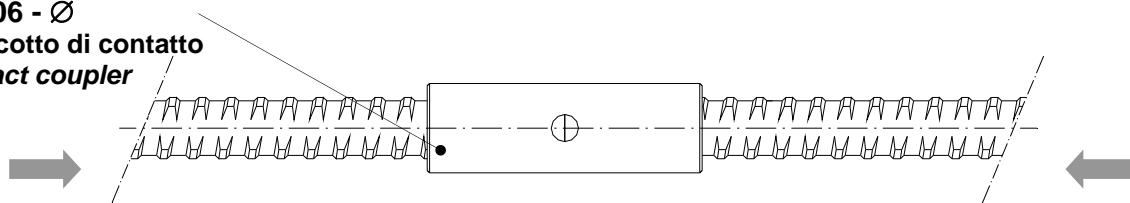
**T 2040 - Ø**  
**controdado, corto**  
**fixing nut, short**



SAS500 Accessori / Accessories	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 3006 - Ø</b> <b>manicotto di contatto</b> <b>contact coupler</b> 	<b>d</b> [mm]	-	-	-	32	36	40	45	52	65	90
	<b>L</b> [mm]	-	-	-	70	80	85	90	120	160	200
	<b>G</b> [kg]	-	-	-	0,25	0,30	0,40	0,50	0,80	1,35	4,25
<b>T 3012 - Ø</b> <b>manicotto di contatto</b> <b>contact coupler</b> 	Ø [mm]	-	-	16/14	20/16	25/20	28/25	32/28	40/32	50/40	-
	<b>SW</b> [mm]	-	-	32	32	41	41	50	65	80	-
	<b>L</b> [mm]	-	-	120	140	175	220	230	260	290	-
	<b>G</b> [kg]	-	-	0,55	0,65	1,15	1,80	2,30	5,00	8,50	-
<b>T 3102 - Ø</b> <b>manicotto con</b> <b>riduzione diametro</b> <b>coupler with</b> <b>diameter reduction</b> 	Ø [mm]	-	-	16/14	20/16	25/20	28/25	32/28	40/32	50/40	-
	<b>d</b> [mm]	-	-	36	36	40	45	52	65	80	-
	<b>L</b> [mm]	-	-	120	130	150	170	180	240	240	-
	<b>G</b> [kg]	-	-	0,55	0,65	1,00	1,40	1,80	3,90	6,00	-

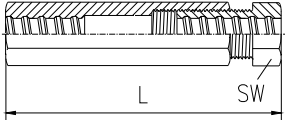
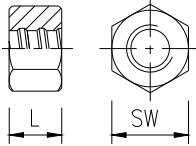
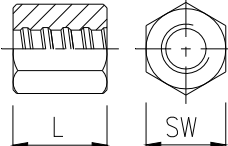
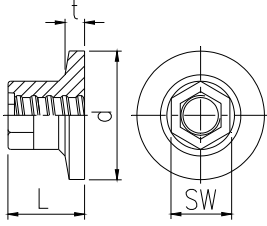
**Esempio di montaggio: manicotto di contatto**  
**Assembly sample – bars junction with coupler:**

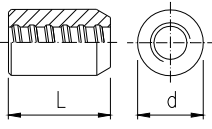
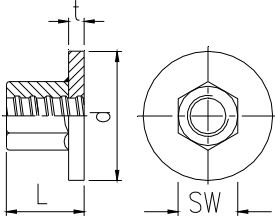
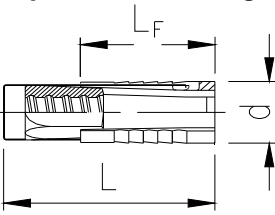
**T 3006 - Ø**  
**manicotto di contatto**  
**contact coupler**

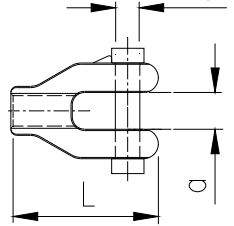

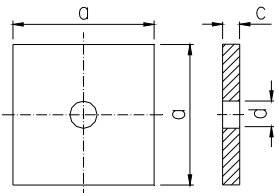
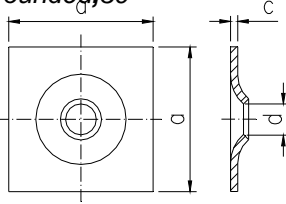


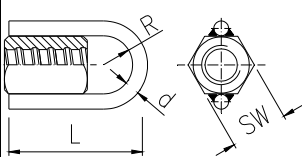
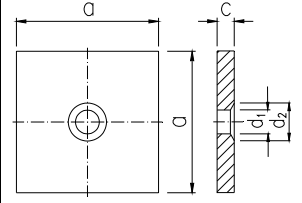
**foro per il controllo del posizionamento**  
**hole for positioning control**



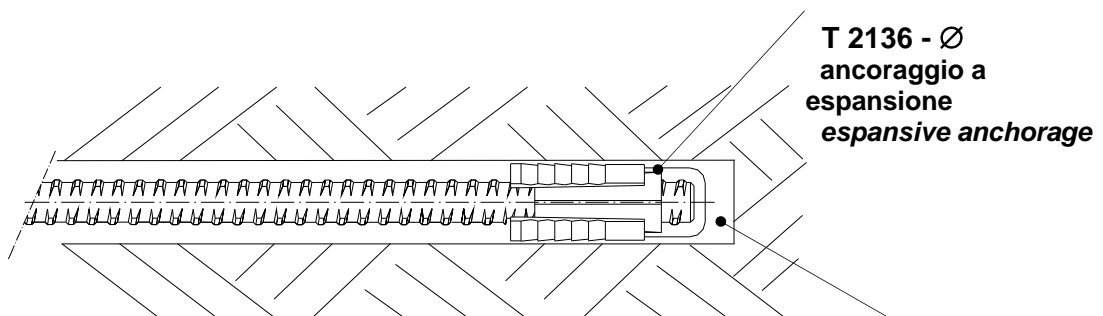
<b>SAS500 Accessori / Accessories</b>	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 3105 - Ø tenditore a vite infeed screw</b> 	<b>SW</b> [mm]	32	32	36	41	46	50	60	80	100	-
	<b>L</b> [mm]	130	140	150	175	190	205	225	270	305	-
	<b>G</b> [kg]	0,70	0,80	0,92	1,14	1,42	1,65	2,87	6,60	15,00	-
<b>T 2040 - Ø controdado, corto fixing nut, short</b> 	<b>SW</b> [mm]	-	-	32	32	41	41	50	60	80	90
	<b>L</b> [mm]	-	-	20	20	20	25	30	35	50	75
	<b>G</b> [kg]	-	-	0,10	0,09	0,15	0,15	0,30	0,45	1,30	2,35
<b>T 2003 - Ø controdado, lungo fixing nut, long</b> 	<b>SW</b> [mm]	19	27	32	32	41	41	50	60	80	90
	<b>L</b> [mm]	20	25	30	40	40	45	50	65	80	115
	<b>G</b> [kg]	0,04	0,10	0,15	0,17	0,28	0,27	0,50	0,85	2,10	3,75
<b>T 2073 - Ø ancoraggio circolare round anchorplate</b> 	<b>SW</b> [mm]	-	30	30	36	41	46	50	65	80	-
	<b>L</b> [mm]	-	33	33	40	45	50	60	70	85	-
	<b>d</b> [mm]	-	50	50	65	70	90	100	120	150	-
	<b>t</b> [mm]	-	8	8	10	10	12	20	17	20	-
	<b>G</b> [kg]	-	0,25	0,22	0,39	0,51	1,00	1,40	1,85	3,75	-

<b>SAS500 Accessori / Accessories</b>	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 3022 - Ø dado cilindrico, saldabile cylindric nut, weldable</b> 	<b>d</b> [mm]	30	36	40	45	50	55	60	80	90	114
	<b>L</b> [mm]	30	40	45	50	55	60	65	80	90	120
	<b>G</b> [kg]	0,12	0,24	0,33	0,44	0,55	0,73	0,91	2,11	2,77	6,75
<b>T 2973 - Ø ancoraggio circolare round anchorage</b> 	<b>SW</b> [mm]	-	-	-	-	-	-	-	60	80	100
	<b>L</b> [mm]	-	-	-	-	-	-	-	70	80	115
	<b>d</b> [mm]	-	-	-	-	-	-	-	120	150	250
	<b>t</b> [mm]	-	-	-	-	-	-	-	17	20	30
	<b>G</b> [kg]	-	-	-	-	-	-	-	2,10	4,00	14,50
<b>T 2136 - Ø ancoraggio a espansione expansive anchorage</b> 	<b>d</b> [mm]	-	-	-	39	49	49	59	-	-	-
	<b>L</b> [mm]	-	-	-	110	120	120	150	-	-	-
	<b>L<sub>F</sub></b> [mm]	-	-	-	80	70	70	90	-	-	-
	<b>G</b> [kg]	-	-	-	0,44	0,62	0,58	1,01	-	-	-

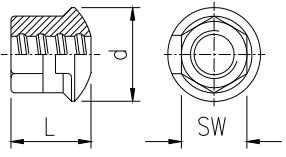
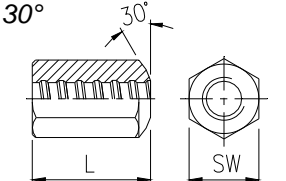
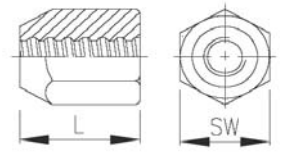
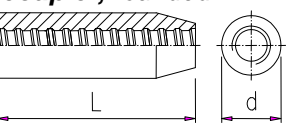
SAS500 Accessori / Accessories	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 2926 - Ø</b> <b>ancoraggio a</b> <b>espansione</b> <b>expansive anchorage</b> 	<b>a</b> [mm]	-	-	-	30	30	-	-	-	-	-
	<b>d</b> [mm]	-	-	-	20	20	-	-	-	-	-
	<b>L</b> [mm]	-	-	-	120	120	-	-	-	-	-
	<b>G</b> [kg]	-	-	-	1,17	1,10	-	-	-	-	-
<b>T 9001 - Ø</b> <b>punta a scalpello</b> <b>chisel tip</b> 	<b>&lt;</b> [°]	-	-	-	-	60	60	60	-	-	-
<b>T 2008 - Ø</b> <b>piastra d'ancoraggio,</b> <b>piana</b> <b>anchorplate, flat, small</b> 	<b>a</b> [mm]	-	-	-	-	-	-	-	120	150	-
	<b>c</b> [mm]	-	-	-	-	-	-	-	17	20	-
	<b>d</b> [mm]	-	-	-	-	-	-	-	45	58	-
	<b>G</b> [kg]	-	-	-	-	-	-	-	1,70	3,10	-
<b>T 2132 - Ø</b> <b>piastra d'ancoraggio,</b> <b>bombata, 30°</b> <b>anchorplate,</b> <b>rounded, 30°</b> 	<b>a</b> [mm]	-	-	-	150	150	200	200	-	-	-
	<b>c</b> [mm]	-	-	-	10	10	10	12	-	-	-
	<b>d</b> [mm]	-	-	-	26	34	34	40	-	-	-
	<b>G</b> [kg]	-	-	-	1,70	1,65	3,10	3,70	-	-	-

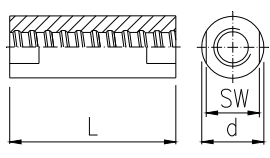
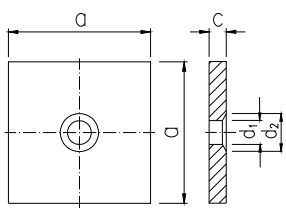
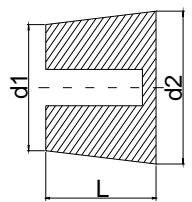
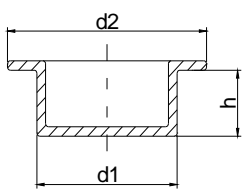
<b>SAS500 Accessori / Accessories</b>	$\varnothing$ [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 2927 - <math>\varnothing</math> dado con occhiello nut with eyelet</b>  	<b>SW</b> [mm]	-	-	-	36	41	46	55	-	-	-
	<b>L</b> [mm]	-	-	-	85	90	105	110	-	-	-
	<b>d</b> [mm]	-	-	-	16	16	16	16	-	-	-
	<b>R</b> [mm]	-	-	-	18	20	23	27	-	-	-
	<b>G</b> [kg]	-	-	-	0,35	0,45	0,60	0,95	-	-	-
<b>T 2928 - <math>\varnothing</math> piastra d'ancoraggio, grande, 30° anchorplate, big, 30°</b>  	<b>a</b> [mm]	-	-	-	-	-	200	200	-	-	-
	<b>c</b> [mm]	-	-	-	-	-	20	20	-	-	-
	<b>d<sub>1</sub></b> [mm]	-	-	-	-	-	33	40	-	-	-
	<b>d<sub>2</sub></b> [mm]	-	-	-	-	-	45	50	-	-	-
	<b>G</b> [kg]	-	-	-	-	-	6,15	6,10	-	-	-

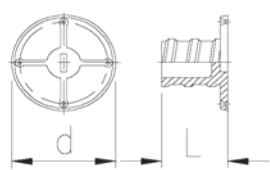
**Esempio di montaggio – ancoraggio a espansione**  
**Sample assembly – expansive anchorage**

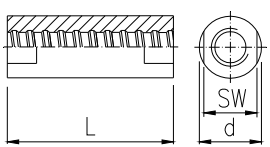
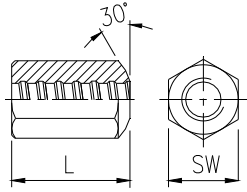


<sup>1)</sup> il diametro della foratura dipende dal diametro del ancoraggio a espansione  
<sup>1)</sup> diameter of perforation depend from expansive anchorage diameter

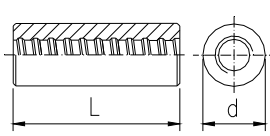
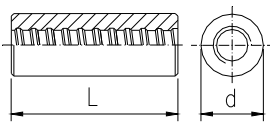
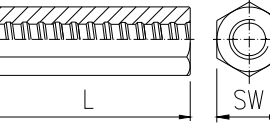
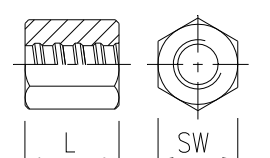
<b>SAS500 Accessori / Accessories</b>	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 2944 - Ø</b> <b>dado a calotta, 30°</b> <b>conic nut, 30°</b> 	<b>SW</b> [mm]	-	-	-	36	41	41	50	65	80	-
	<b>L</b> [mm]	-	-	-	40	45	50	60	70	85	-
	<b>D</b> [mm]	-	-	-	51	54	58	62	85	100	-
	<b>G</b> [kg]	-	-	-	0,30	0,35	0,40	0,70	1,50	2,70	-
<b>T 2963 - Ø</b> <b>dado d'ancoraggio,</b> <b>bombato, 30°</b> <b>fixing nut, rounded,</b> <b>30°</b> 	<b>SW</b> [mm]	-	-	-	36	41	46	55	65	80	100
	<b>L</b> [mm]	-	-	-	45	50	55	60	70	90	115
	<b>D</b> [mm]	-	-	-	-	-	-	-	-	-	108
	<b>G</b> [kg]	-	-	-	0,25	0,33	0,47	0,75	1,15	2,15	4,65
<b>T 3026 - Ø</b> <b>dado esagonale,</b> <b>welding bolt,</b> <b>hexagonal</b> 	<b>SW</b> [mm]	32	36	41	46	50	55	60	80	90	-
	<b>L</b> [mm]	40	50	55	65	75	85	90	105	120	-
	<b>G</b> [kg]	0,21	0,34	0,48	0,70	0,89	1,21	1,49	3,05	4,10	-
<b>T 3901 - Ø</b> <b>manicotto,</b> <b>smussato</b> <b>coupler, rounded</b> 	<b>d</b> [mm]	-	-	-	36	40	45	52	-	-	-
	<b>L</b> [mm]	-	-	-	105	115	125	140	-	-	-
	<b>G</b> [kg]	-	-	-	0,49	0,58	0,80	1,30	-	-	-

<b>SAS500 Accessori / Accessories</b>	$\emptyset$ [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 3927 - <math>\emptyset</math> manicotto, temperato coupler, tempered</b>  	<b>SW</b> [mm]	-	-	-	-	-	-	-	50	60	80
	<b>d</b> [mm]	-	-	-	-	-	-	-	56	70	95
	<b>L</b> [mm]	-	-	-	-	-	-	-	150	180	230
	<b>G</b> [kg]	-	-	-	-	-	-	-	1,65	2,90	5,90
<b>T 1928 - <math>\emptyset</math> piastra d'ancoraggio, 30° anchorplate, 30°</b>  	<b>a</b> [mm]	-	-	-	70	70	100	120	150	190	245
	<b>c</b> [mm]	-	-	-	10	10	12	20	30	45	50
	<b>d<sub>1</sub></b> [mm]	-	-	-	25	30	33	40	47	58	78
	<b>d<sub>2</sub></b> [mm]	-	-	-	35	40	45	50	60	75	110
	<b>G</b> [kg]	-	-	-	0,35	0,35	0,90	2,00	4,90	11,85	22,10
<b>T 5050 - <math>\emptyset</math> recesso recess cone</b>  	<b>d<sub>1</sub></b> [mm]	50	60	60	70	80	90	110	-	-	-
	<b>d<sub>2</sub></b> [mm]	59	70	72	84	96	107	127	-	-	-
	<b>L</b> [mm]	50	60	70	80	90	100	100	-	-	-
	<b>G</b> [kg]	0,02	0,04	0,05	0,07	0,10	0,14	0,21	-	-	-
<b>T 5025 - <math>\emptyset</math> cap interno inner cap</b>  	<b>d<sub>1</sub></b> [mm]	13,0	14,5	17,1	20,7	26,0	30,0	33,2	-	-	-
	<b>d<sub>2</sub></b> [mm]	18,7	19,4	24,6	24,7	30,0	34,0	37,2	-	-	-
	<b>h</b> [mm]	7,00	7,50	9,00	8,50	8,50	8,50	8,50	-	-	-

SAS500 Accessori / Accessories	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 5979 - Ø</b> <b>chiodo piatto</b> <b>nail plate</b> 	d [mm]	36	42	48	48	58	58	68	-	-	-
	L [mm]	20	20	25	30	35	40	45	-	-	-

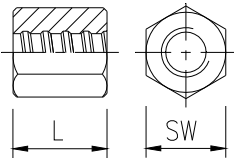
Accessori (senza rivestimento) per barre filettate rivestite in epoxy Accessories (without cover) for threaded epoxy coated bars												
SAS500 Accessori / Accessories	Ø [mm]	12	14	16	20	25	28	32	40	50	63,5	
<b>T 2002 EP - Ø</b> <b>dado d'ancoraggio,</b> <b>piano</b> <b>anchor nut, flat</b> 	SW [mm]	22	27	32	36	41	46	55	65	80	100	
	d [mm]	-	-	-	-	-	-	-	-	-	108	
	L [mm]	30	40	50	55	60	65	75	85	105	130	
	G [kg]	0,07	0,14	0,27	0,35	0,45	0,62	1,07	1,60	2,95	3,75	
<b>T 2963 EP - Ø</b> <b>dado d'ancoraggio,</b> <b>30°</b> <b>bull nose nut, 30°</b> 	SW [mm]	-	-	-	36	41	46	55	65	80	100	
	d [mm]	-	-	-	-	-	-	-	-	-	108	
	L [mm]	-	-	-	55	60	65	75	85	105	130	
	G [kg]	-	-	-	0,34	0,43	0,60	1,05	1,55	2,90	3,70	

**Accessori (senza rivestimento) per barre filettate rivestite in epoxy**  
**Accessories (without cover) for threaded epoxy coated bars**

<b>SAS500</b> <b>Accessori /</b> <b>Accessories</b>	$\varnothing$ [mm]	12	14	16	20	25	28	32	40	50	63,5
<b>T 3003 EP - <math>\varnothing</math></b> <b>accoppiatore, standard</b> <b>coupler, standard</b> 	<b>d</b> [mm]	22	27	32	36	40	45	52	65	80	102
	<b>L</b> [mm]	75	90	105	120	135	145	160	190	235	300
	<b>G</b> [kg]	0,15	0,28	0,48	0,65	0,81	1,11	1,66	3,07	5,60	11,70
<b>T 3006 EP - <math>\varnothing</math></b> <b>Accoppiatore di</b> <b>contatto</b> <b>Contact coupler</b> 	<b>d</b> [mm]	-	-	-	32	36	40	45	52	65	90
	<b>L</b> [mm]	-	-	-	70	80	85	90	120	160	200
	<b>G</b> [kg]	-	-	-	0,25	0,30	0,40	0,50	0,80	1,35	4,25
<b>T 3010 EP - <math>\varnothing</math></b> <b>Accoppiatore</b> <b>esagonale</b> <b>hexagonal coupler</b> 	<b>SW</b> [mm]	22	27	32	32	41	41	50	65	80	-
	<b>L</b> [mm]	80	100	120	140	160	180	180	210	240	-
	<b>G</b> [kg]	0,20	0,36	0,60	0,75	1,10	1,05	1,75	2,75	6,05	-
<b>T 2003 EP - <math>\varnothing</math></b> <b>dado d'ancoraggio,</b> <b>lungo</b> <b>lock nut, long</b> 	<b>SW</b> [mm]	19	27	32	32	41	41	50	60	80	90
	<b>d</b> [mm]	-	-	-	-	-	-	-	-	-	102
	<b>L</b> [mm]	25	30	35	45	50	55	60	75	95	130
	<b>G</b> [kg]	0,05	0,12	0,18	0,19	0,35	0,45	0,60	1,00	2,50	4,24



**Accessori (senza rivestimento) per barre filettate rivestite in epoxy**  
**Accessories (without cover) for threaded epoxy coated bars**

<b>SAS500</b> <b>Accessori /</b> <b>Accessories</b>	$\varnothing$ [mm]	<b>12</b>	<b>14</b>	<b>16</b>	<b>20</b>	<b>25</b>	<b>28</b>	<b>32</b>	<b>40</b>	<b>50</b>	<b>63,5</b>
<b>T 2040 EP - <math>\varnothing</math></b> <b>dado d'ancoraggio,</b> <b>corto</b> <b>lock nut, short</b> 	<b>SW</b> [mm]	-	-	32	32	41	41	50	60	80	90
	<b>d</b> [mm]	-	-	-	-	-	-	-	-	-	102
	<b>L</b> [mm]	-	-	30	40	40	45	50	65	80	115
	<b>G</b> [kg]	-	-	0,15	0,17	0,28	0,37	0,50	0,85	2,10	3,75

## Soluzioni applicative

TENSACCIAI è in grado di fornire un'ampia gamma di personalizzazione dei prodotti, che ne consenta dunque l'utilizzo in forma nuove e diverse.

Alcune di queste sono qui di seguito riassunte e prevedono l'impiego di sistemi di pre-iniezione e di protezione permanente dielettrica per aumentare la protezione alla corrosione.

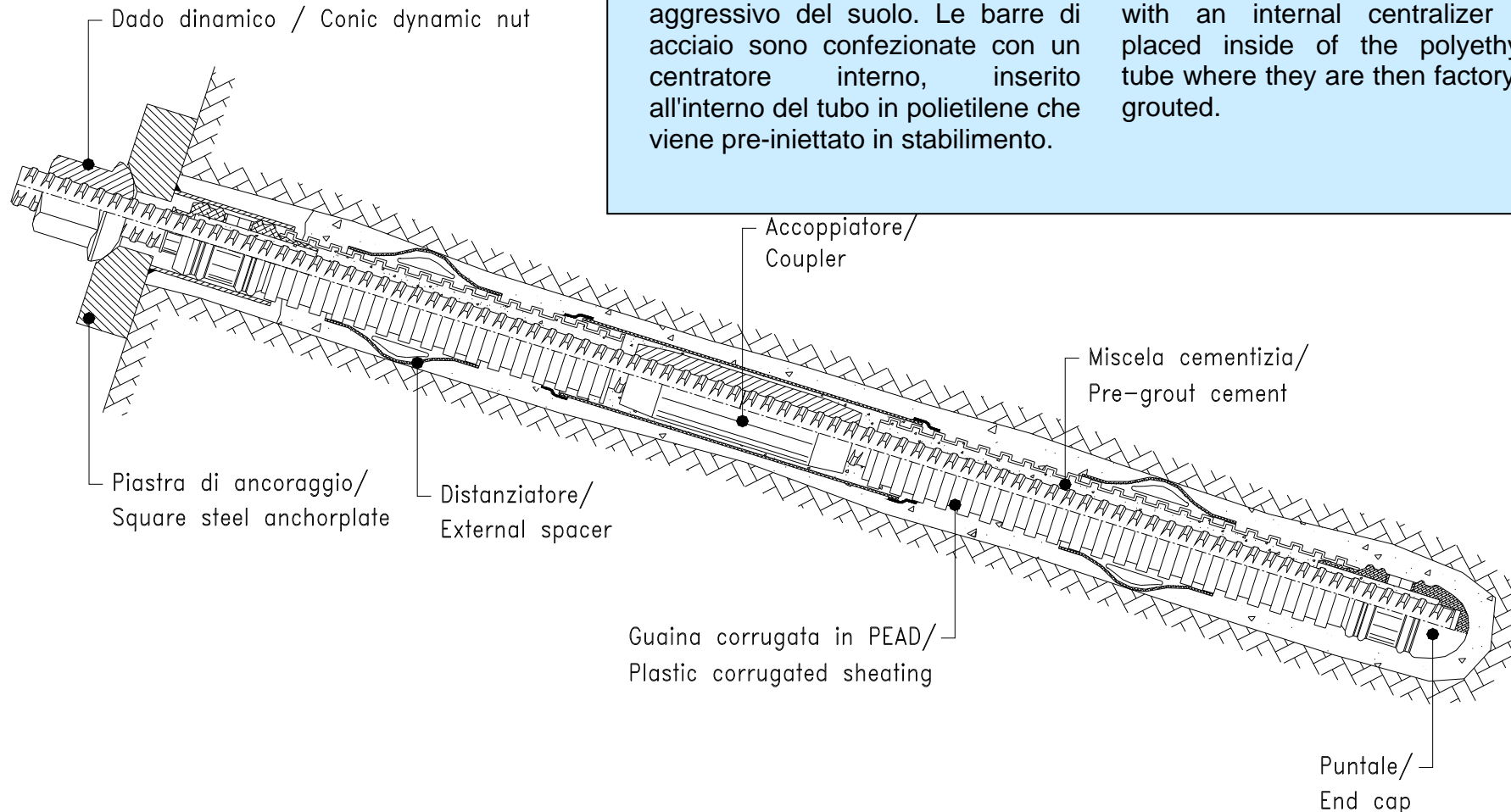
## Technical application of products

TENSACCIAI is able to provide a wide range of products customisation which enables use in new and different shapes. Some of those are below summarised and foresee the utilisation of pre-grouting and electrically insulation systems, in order to improve corrosion protection.

## Barre pre-iniettate / Pre-grouted bars

L'iniezione di miscela cementizia della guaina corrugata in polietilene è spesso utilizzata per fornire un'ulteriore barriera anticorrosione contro l'attacco altamente aggressivo del suolo. Le barre di acciaio sono confezionate con un centratore interno, inserito all'interno del tubo in polietilene che viene pre-iniettato in stabilimento.

Cement Grout filled corrugated polyethylene tubing is often used to provide an additional barrier against corrosion attack in highly aggressive soils. The steel bars are wrapped with an internal centralizer then placed inside of the polyethylene tube where they are then factory pre-grouted.



## Barre elettricamente isolate / Electrically insulated bars

I tiranti a barre TENSACCIAI forniscono una protezione dielettrica alla corrosione completa. La zona dell'ancoraggio è interamente riempita con cera petrolifera, e viene interposto tra l'ancoraggio ed il supporto in acciaio un disco dielettrico, in modo da ridurre al minimo il rischio della trasmissione di correnti vaganti.

TENSACCIAI bars ground anchors provide complete dielectric corrosion protection. The anchorage zone is hermetically and completely filled with dielectric petroleum based wax, and there is a dielectric disc interposed between the anchorplate and the inferior steel plate, in order to avoid the risk of transmission of any electricity.

