MEHNA

Construction & Precast

Technical Catalogue

Coupler Splicing Systems

Precast Lifting Systems & Accessories

Spherical Lifting System & Accessories

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All dimensions are in millimetres unless stated otherwise. Safe working loads apply at the concrete strength stated with each table.

Part 1

Coupler Splicing Systems

Easy Fix Rebar Coupler System

Introduction

TECNIA Easy-Fix Rebar Coupling System is a mechanical rebar splicing system. Thanks to its dual-sleeve rebar bond and connection through a high-strength bolt, it has the following advantages:

- Dual sleeve: each rebar is cold-swaged inside one sleeve, and the press quality is guaranteed by a powerful and reliable cold swage. The one bar – one sleeve system also avoids any possible stress concentration that occurs in 2 bars – one sleeve systems.
- The rebar-sleeve bond press is done prior to site connection, saving precious site time.
- Sleeves are connected through a high-strength bolt, quality ensured.
- Installation at site is easy and fast, even in dense cages. No X-ray check is needed, and installation can be done in any weather conditions.
- No thread cutting, no heat or pre-heat on the rebar, hence the rebar keeps its original characteristics after splicing.
- Stands full tension as well as full compression.



Types of Coupler

TECNIA offers 4 types of dual-sleeve rebar coupling system to meet various application requirements.

All are produced from precision seamless steel with balanced mechanical properties for both high swageability and load-carrying capacity.

TBC Standard Coupler

TBC suits general applications such as beams and walls, where the rotation of the rebar is possible.



TSD Standard Coupler

Similar to TBC, while the bolt is made on one sleeve.



TBS Dual Coupler Standard

TBS suits long rebar connections, or bent rebar where the rotation of the rebar is difficult or even impossible. It is required that one rebar is movable.



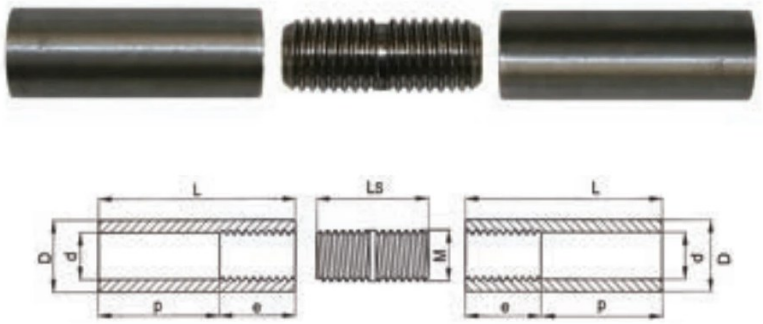
TSE Dual Coupler Long

Suits the most difficult connections, where the rebars must be positioned accurately, such as in a cage. The deviation adjustability makes the cage connection easy and accurate.



TBC Standard Coupler

Suitable for general applications such as beams and walls, where the rotation of the rebar is possible. Screw the bolt into one sleeve first, then rotate one rebar to screw the other bolt end into the other sleeve.



Technical Data

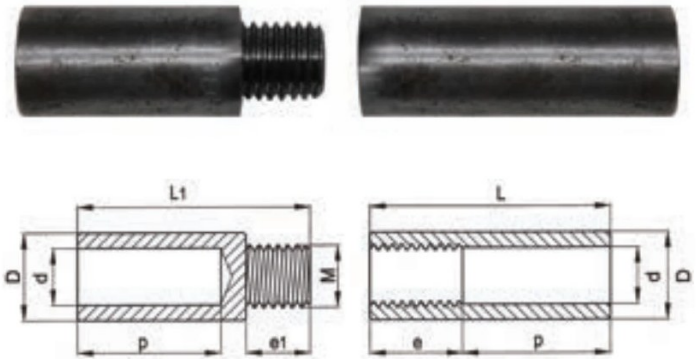
Description	Bar Ø (mm)	Thread M	D (mm)	d (mm)	L (mm)	e (mm)	p (mm)	Ls (mm)
TBC 10	10	12	17.5	12	47	20	27	30
TBC 12	12	16	22	14.5	57	27	31	38
TBC 14	14	18	26	17	68	31	37	44
TBC 16	16	20	28	19	77	35	42	48
TBC 18	18	22	31	22	87	38	49	53
TBC 20	20	24	34	23.5	94	41	53	57
TBC 22	22	27	38	25	101	45	56	63
TBC 25	25	30	42	29	114	50	64	71
TBC 28	28	33	46	31	125	54	71	77
TBC 30	30	36	50	34	138	61	77	84
TBC 32	32	42	54.5	36	148	65	83	90
TBC 34	34	42	58	38	158	69	88	98
TBC 40	40	48	67.5	45	182	78	104	111

Special advantage

Use the standard female (sleeve) only. There is no need to specify males and females, which is more efficient for rebar pressing.

TSD Standard Coupler

Similar to TBC, while the bolt is made on one sleeve as a male.

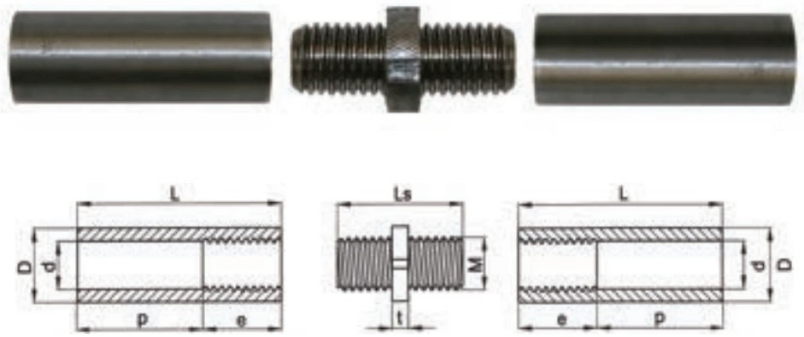


Technical Data

Description	Bar Ø (mm)	Thread M	D (mm)	d (mm)	L (mm)	e (mm)	L1 (mm)	e1 (mm)	p (mm)
TSD 10	10	12	17.5	12	47	20	47	14	27
TSD 12	12	16	22	14.5	57	27	58	18.5	31
TSD 14	14	18	26	17	68	31	68	20.5	37
TSD 16	16	20	28	19	77	35	77	22.5	42
TSD 18	18	22	31	22	87	38	87	25	49
TSD 20	20	24	34	23.5	94	41	94	27	53
TSD 22	22	27	38	25	101	45	101	30	56
TSD 25	25	30	42	29	114	50	114	33.5	64
TSD 28	28	33	46	31	125	45	125	36.5	71
TSD 30	30	36	50	34	138	61	138	40	77
TSD 32	32	42	54.5	36	148	65	148	43	83
TSD 34	34	42	58	38	158	69	157	46	88
TSD 40	40	48	67.5	45	182	78	182	53	104

TBS Dual Coupler Standard

An improved turnbuckle type with a central autofit nut. Turning the autofit nut screws the left- and right-hand threaded bar into both sleeves at the same time, and the autofit nut ensures the complete and firm lock of the thread connection. It is suitable for long rebar connections, or bent rebar where the rotation of the rebar is difficult or even impossible. It only requires that one rebar is movable in its axial direction.

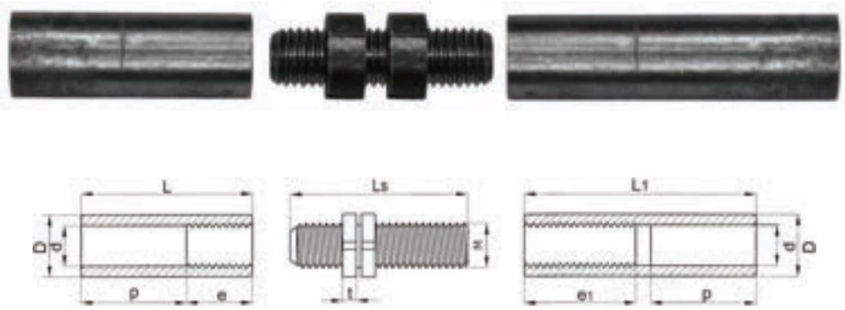


Technical Data

Description	Bar Ø (mm)	Thread M	D (mm)	d (mm)	L (mm)	e (mm)	p (mm)	Ls (mm)	t (mm)
TBS 10	10	12	17.5	12	47	20	27	34	6
TBS 12	12	16	22	14.5	58	27	31	43	6
TBS 14	14	18	26	17	68	31	37	48	7
TBS 16	16	20	28	19	77	35	42	53	8
TBS 18	18	22	31	22	87	38	49	59	9
TBS 20	20	24	34	23.5	94	41	53	64	10
TBS 22	22	27	38	25	101	45	56	71	11
TBS 25	25	30	42	29	114	50	64	79	12
TBS 28	28	33	46	31	125	54	71	86	13
TBS 30	30	36	50	34	138	61	77	94	14
TBS 32	32	42	54.5	36	148	65	83	102	16
TBS 34	34	42	58	38	157	69	88	110	17
TBS 40	40	48	67.5	45	182	78	104	125	19

TSE Dual Coupler Long

Suitable for the most difficult connections, where the rebars must be positioned accurately, such as in a cage. The deviation adjustability makes the cage connection easy and accurate. The rebar remains in its position, and no rotation or movement is needed for either bar.



Technical Data

Description	Bar Ø (mm)	Thread M	D (mm)	d (mm)	L (mm)	e (mm)	p (mm)	L1 (mm)	e1 (mm)	t (mm)	Ls (mm)
TSE 10	10	12	17.5	12	47	20	27	66	33	8	70
TSE 12	12	16	22	14.5	57	27	31	81	42	8	84
TSE 14	14	18	26	17	68	31	37	96	49	10	99
TSE 16	16	20	28	19	77	35	42	107	53	12	109
TSE 18	18	22	31	22	87	38	49	119	57	12	117
TSE 20	20	24	34	23.5	94	41	53	130	63	15	132
TSE 22	22	27	38	25	101	45	56	140	69	16	143
TSE 25	25	30	42	29	114	50	64	158	75	18	161
TSE 28	28	33	46	31	125	45	71	172	84	20	174
TSE 30	30	36	50	34	138	61	77	189	92	22	192
TSE 32	32	42	54.5	36	148	65	83	209	104	24	211
TSE 34	34	42	58	38	158	69	88	223	112	25	227
TSE 40	40	48	67.5	45	182	78	104	265	136	27	263

Special advantages

Deviation adjustability makes the cage connection easy and accurate.

No movement or rotation of rebar or sleeve.

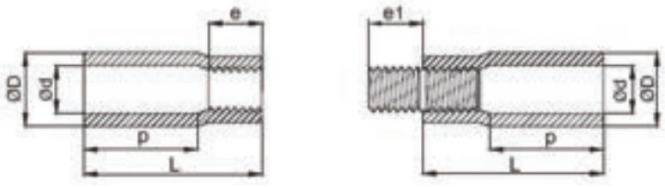
No tension during installation; the bolt is easy to screw.

TOS Optimized Standard Coupler

Thanks to TECNIA's Neck-Down Technique, the TOS has the following special advantages:

- The thread strength is greatly increased by the neck-down process.
- The insertion of the rebar is stopped automatically by the shoulder, which is more efficient.





The TOS coupler is suitable for general applications such as beams and walls, where the rotation of the rebar is possible. Installation is easy: simply screw the male coupler into the female coupler.

Technical Data

Description	Bar Ø (mm)	Thread M	D (mm)	d (mm)	L (mm)	e = e1 (mm)	p (mm)
TOS 14	14	16	25	17	60	19	35
TOS 16	16	18	28	19	69	22	40
TOS 18	18	20	31	22	77	24	45
TOS 20	20	22	34	23.5	85	26	50
TOS 22	22	24	38	25	93	29	55
TOS 25	25	27	42	29	105	32	62.5
TOS 28	28	30	46	31	116	36	70
TOS 30	30	33	50	34	125	40	75
TOS 32	32	36	53	36	133	43	80
TOS 40	40	42	65	45	156	50	95

Special features

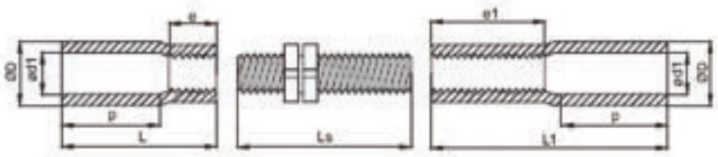
The bolt is fixed onto one sleeve to facilitate installation.

TOE Dual Optimized Coupler

Thanks to TECNIA's Neck-Down Technique, the TOE has the following advantages:

- The thread strength is greatly increased by the neck-down process.
- The insertion of the rebar is automatically stopped by the shoulder, which makes it more efficient.





Suitable for the most difficult connections, where the rebar must be positioned accurately, such as in a cage. The deviation adjustability makes the cage connection easy and accurate. The rebar remains in its position, and no rotation or movement is needed for either rebar.

Technical Data

Description	Bar Ø (mm)	Thread M	D (mm)	d1 (mm)	L (mm)	L1 (mm)	e (mm)	e1 (mm)	p (mm)
TOE 14	14	M 16	25	17	60	83	18	41	35
TOE 16	16	M 18	28	19	69	95	20.5	47	40
TOE 18	18	M 20	31	22	77	106	22.5	52	45
TOE 20	20	M 22	34	23.5	85	117	24.5	57	50
TOE 22	22	M 24	38	25	93	129	27	63	55
TOE 25	25	M 27	42	29	105	144.5	30	69	62.5
TOE 28	28	M 30	46	31	116	160	33.5	80	70
TOE 30	30	M 33	50	34	125	172	36.5	87	75
TOE 32	32	M 36	53	36	133	187	40	99	80
TOE 40	40	M 42	65	45	156	235	46.5	125	95

Special features

Deviation adjustability makes the cage connection easy and accurate.

No movement or rotation of rebar or sleeve.

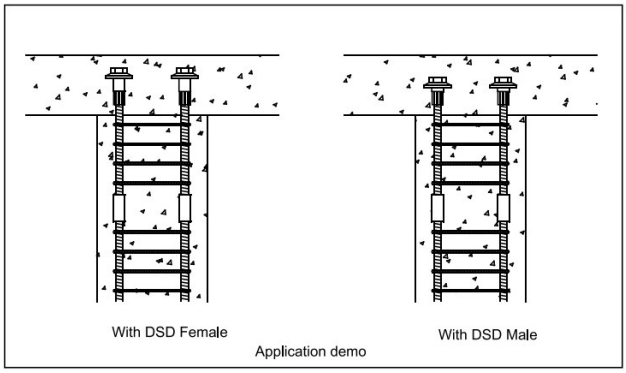
No tension during installation; the bolt is easy to screw.

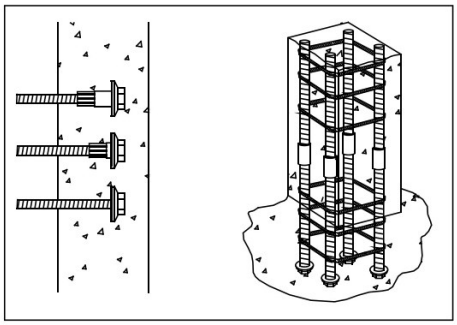
Rebar End Anchor

The TECNIA Rebar End Anchor is a mechanical anchorage for rebar in concrete. The design is in compliance with ACI 318-08 and BS8110. It is designed to be used in concrete with rebars to popular international codes such as ASTM A615, BS4449 and ENV10080, with rebar sizes from 12 mm to 52 mm.

The TECNIA Rebar End Anchor is a steel anchor with a large foot. Threaded onto a TECNIA TSD coupler that is already pressed on the end of a rebar, it provides anchorage performance within the concrete just as a hooked or bent bar does.







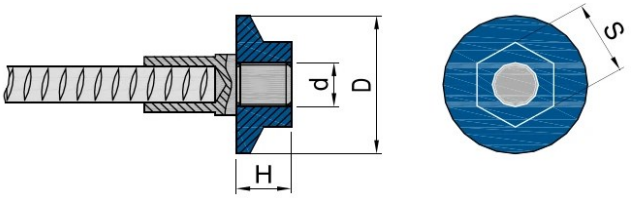
Features

- Designed to work with the TECNIA TSD or TSE coupler system; easy, flexible and fast to install.
- It replaces the bent part or hook of the rebar. The reduced congestion gives more design flexibility, as well as cost savings from the rebar saved.
- Hex head for easy installation at site.
- Future extensions allowed.

The TECNIA End Anchor can be applied in beams, columns, piles and similar elements, and future extensions can be easily arranged.

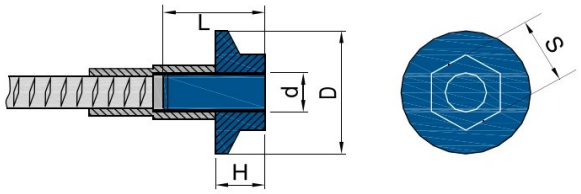
TSA End Anchor

TECNIA offers 2 types of end anchor, suitable for the TSD male coupler and female coupler respectively. Type TSA-M works with the TSD male coupler, and TSA-F with the TSD female coupler.



Type TSA-M (suitable for TECNIA TSD male coupler)

Part No.	Suitable TSD Male	Rebar Dia. (mm)	d (mm)	D (mm)	S (mm)	H (mm)
TSA-M-16	TSD 16	16	M 20	52	30	20
TSA-M-18	TSD 18	18	M 22	58	34	23
TSA-M-20	TSD 20	20	M 24	65	36	25
TSA-M-25	TSD 25	25	M 30	80	46	31
TSA-M-28	TSD 28	28	M 33	90	50	34
TSA-M-30	TSD 30	30	M 36	95	55	36
TSA-M-32	TSD 32	32	M 42	105	65	38
TSA-M-34	TSD 34	34	M 42	110	65	40
TSA-M-40	TSD 40	40	M 48	130	75	46



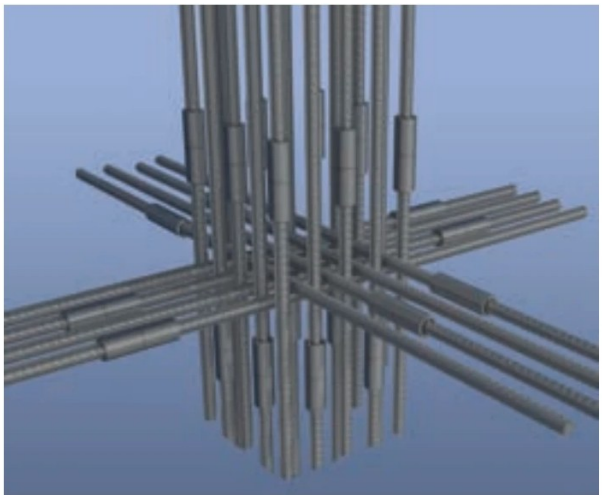
Type TSA-F (suitable for TECNIA TSD female coupler)

Part No.	Suitable TSD Female	Rebar Dia. (mm)	d (mm)	D (mm)	S (mm)	H (mm)	L (mm)
TSA-F-16	TSD 16	16	M 20	52	30	20	40
TSA-F-18	TSD 18	18	M 22	58	34	23	46
TSA-F-20	TSD 20	20	M 24	65	36	25	50
TSA-F-25	TSD 25	25	M 30	80	46	31	62
TSA-F-28	TSD 28	28	M 33	90	50	34	68
TSA-F-30	TSD 30	30	M 36	95	55	36	72
TSA-F-32	TSD 32	32	M 42	105	65	38	76
TSA-F-34	TSD 34	34	M 42	110	65	40	80
TSA-F-40	TSD 40	40	M 48	130	75	46	92

Standard Application for Easy Fix Coupler

Decrease bar congestion

Lap splices create more congestion in the concrete element; using couplers eliminates this additional reinforcement.

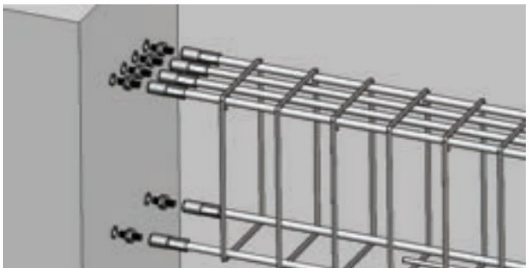


Minimal congestion in a column or beam with slab connection when using couplers

Difficult connections solved with TECNIA products

Column & beam connections · TSE Dual Coupler Long (Extendable)

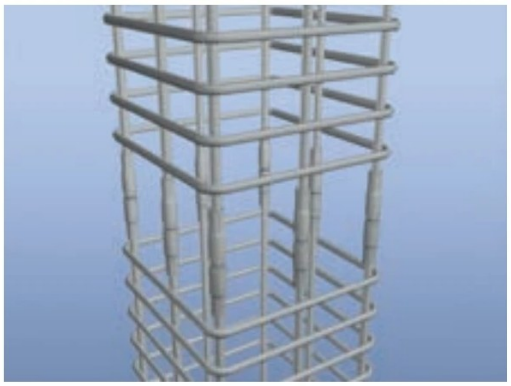
The TSE Dual Coupler is the best choice here. It allows both rebars being connected to remain completely fixed. This type of coupler allows the cage to be fabricated on solid ground and lifted into place, rather than connecting each bar individually. It also allows the beam to be connected in two different places simultaneously. The TSE Dual Coupler can reduce construction time on any project significantly.

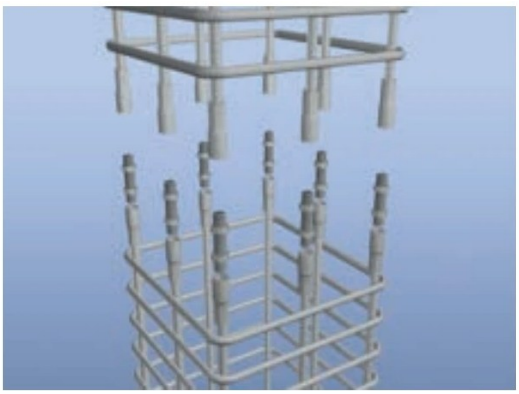


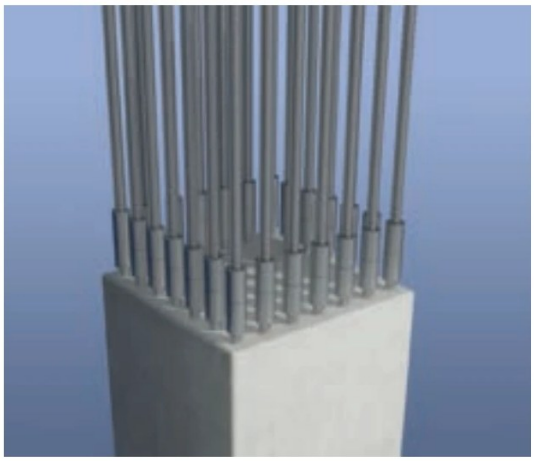
Column Cages

TSE Dual Coupler Long (Extendable)

Large columns are often very difficult and time-consuming to construct. They are usually heavily loaded and require a high number of large rebars. Connecting each rebar by lap splice, or even by standard coupler, can be very slow, and in cases like these lap splices are often not an option. The TSE Dual Coupler Long allows workers to connect entire cages together in a matter of minutes, bringing major savings to the project.

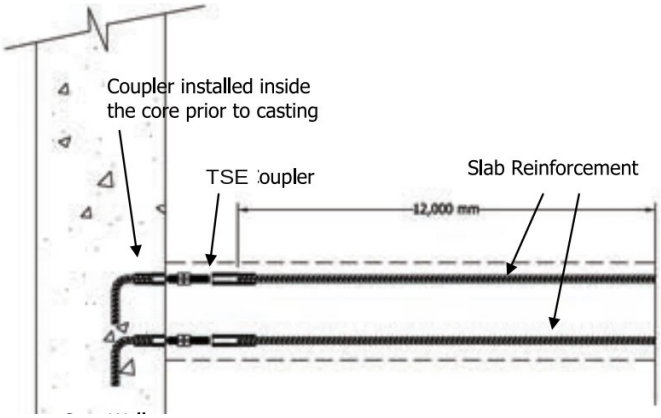


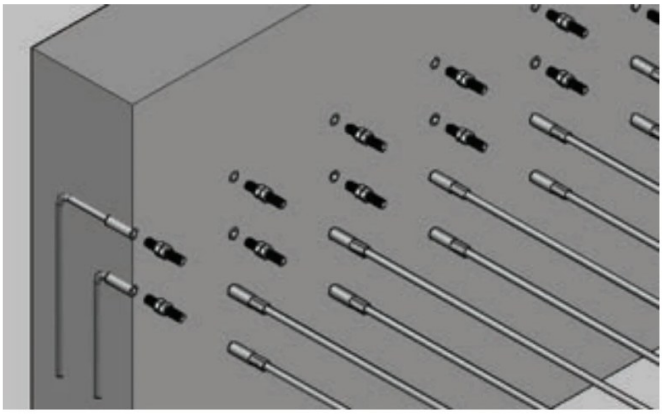




Core Wall & Slab Connections (when using jump forms)

When constructing a high-rise building, the sequence of construction is paramount. Contractors often use jump forms to move up the side of a core wall to attach the slabs. The ideal sequence is casting the core wall approximately 2 to 3 floors ahead of the slab. To achieve this, the slab reinforcement is installed and connected to the wall after the wall has been cast. Typical bar lengths from a manufacturer are 12 m, and when installing slab reinforcement to the core wall it is impossible to rotate such a long bar.





TSE Dual Coupler Long (Extendable)

Since the core wall has already been cast and the bars are too long to rotate, the TSE Dual Coupler Long is ideal. It allows two pieces of rebar to be connected without rotating the bar. The images show the long 12 m bars being connected to the core wall.

BSG Cold Swaged Rebar Coupling System

Introduction

The BSG coupler system is a mechanical rebar splice system made by cold swaging the coupler onto the rebar. The connection reaches the specified ultimate tensile strength as well as the yield strength of the rebar itself.

With TECNIA's specially designed hydraulic press head and portable hydraulic station, it can be used either at the workshop or at site, even on existing rebar for repair.



Features

- **Mechanical connection**, cold swaged: no heat or pre-heat needed, so the original steel properties remain.
- **Can be connected** to existing rebar at site.
- **Splices rebars** with any corrugation pattern and with any protection treatment, such as epoxy-coated rebars.
- **Weldable** to structural steel.
- **Operation** in any weather conditions.
- **Rebar needs** no special preparation, not even of the bar end.
- **Reaches the specified** ultimate tensile strength as well as the yield strength of the rebars, satisfying the most popular standards such as UBC1997, BS8110 and DIN1045.



Highly efficient at site



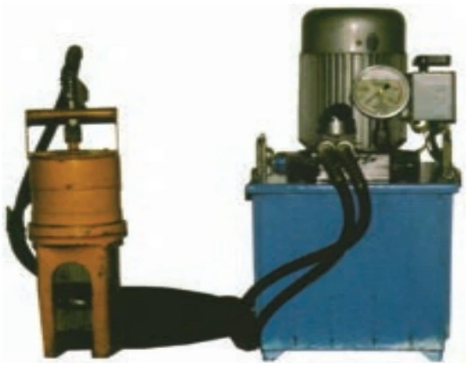
Working with vertical rebar



Swaging Machine

This machine is specially designed to swage the coupler onto the rebar, up to 40 mm.

The machine is lightweight, compact, highly reliable and efficient, and easy to operate. It is suitable for site operation and for vertical couplers.



Key advantage

One press head covers all rebar sizes from Ø18 up to Ø40, which is convenient and highly efficient when connecting rebars of different sizes.

Machine parameters

Model	YJ800
Nominal press force (kN)	800
Nominal pressure (MPa)	52
Cylinder area (cm^2)	154
Stroke (mm)	63
Weight (kg)	45 (55)
Dimension (mm)	Dia. 180 x 495

Coupler dimensions

Rebar diameter (mm)	Ø18	Ø20	Ø22	Ø25	Ø28	Ø32	Ø36	Ø40
Coupler model	BSG18	BSG20	BSG22	BSG25	BSG28	BSG32	BSG36	BSG40
Coupler diameter (mm)	33	36	40	45	50	56	63	70
Coupler length (mm)	108	120	132	150	168	192	216	240
Press die model	Ø18	Ø20	Ø22	Ø25	Ø28	Ø32	Ø36	Ø40
Swaging grooves on each side of coupler	3	3	3	3	4	5	6	7
Press force (T)	45	45	50	60	60	65	67	70
Pressure (MPa)	40	40	44	53	53	57	48	52

Note

The pressure can be adjusted according to actual conditions.

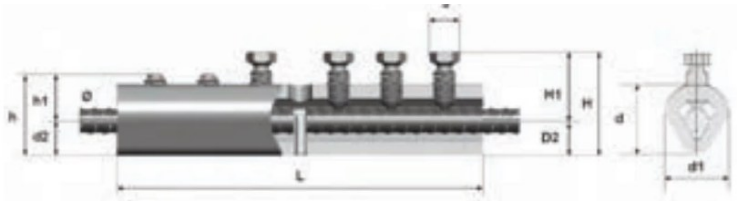
Screw Lock Coupler TSL

Introduction

TECNIA Screw Lock Coupling System: these couplers are made for reinforcement steel with diameters in the range of 10 mm to 40 mm. The connection is made by inserting bars into both ends of the coupler. The breaking bolts are then screwed in by hand and tightened with a ratchet wrench until the bolts shear off. These couplers can be used in particular cases to replace damaged reinforcement with new bars and to connect to an existing structure.

The advantages of TECNIA Screw Lock Couplers

1. Integral connection for steel reinforcement.
2. No need for any bar preparation.
3. Fast, simple and easy to use.
4. Suitable for use with a pneumatic wrench.
5. No need for training (easy to use).
6. No welded components.
7. Correct assembly is easy to check visually.



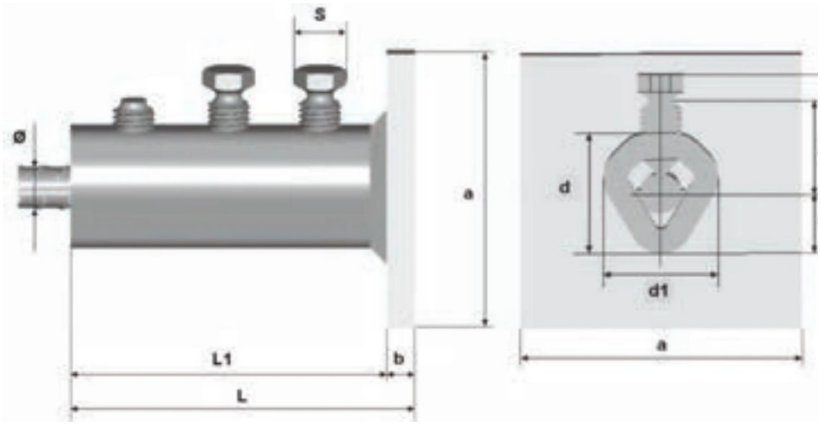
TECNIA Screw Lock Coupling Systems

Type	Ø (mm)	N	M	L (mm)	d (mm)	d1 (mm)	H (mm)	H1 (mm)	D1 (mm)	h (mm)	h1 (mm)	d2 (mm)	S (mm)	Torque moment (Nm)	Mass (kg)
TSL 10	10	6	M12	160	35	33	48	35	13	36	23	13	13	90-99	0.83
TSL 14	14	8	M12	230	37	36	56	38	18	44	26	18	13	90-99	1.29
TSL 16	16	8	M12	230	40	36	57	39	18	45	27	18	13	90-99	1.37
TSL 20	20	10	M16	260	47	44	65	44	21	54	33	21	17	175-192	2.23
TSL 25	25	12	M16	390	56	52	75	45	30	63	33	30	17	175-192	4.51
TSL 32	32	14	M20	480	73	68	91	60	31	77	46	31	22	355-405	9.40
TSL 40	40	18	M20	580	79	73	103	67	36	85	49	36	22	355-405	12.42

TECNIA Screw Lock Coupling with End Anchoring

The coupler with end anchoring is designed to ensure dead-end embedment of reinforcement steel bars in concrete. This helps to reduce congestion and simplify the placement of reinforcement bars by removing the need for hooked ends.

The TECNIA anchor consists of half of a TECNIA Screw Lock Coupler with a plate welded to one end, which transfers the full tensile load of the bar when it bears against the concrete. An advantage of this system is that no special preparation of the reinforcement bar is needed.

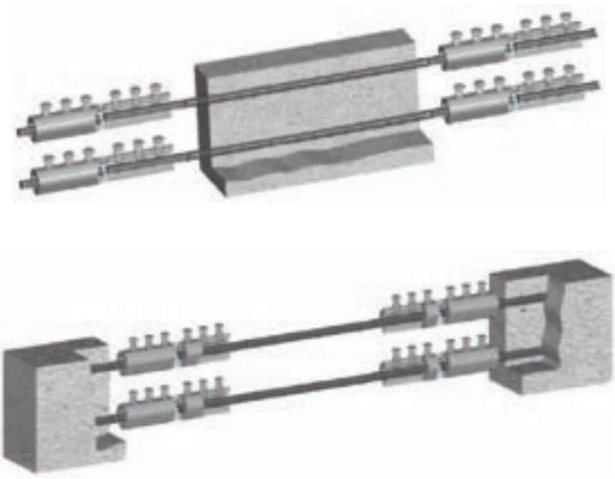


Technical Data

Type	Ø (mm)	N	M	L (mm)	d (mm)	d1 (mm)	H (mm)	H1 (mm)	H2 (mm)	h (mm)	h1 (mm)	h2 (mm)	S (mm)	Torque moment (Nm)	Mass (kg)
TSL-ED 10	10	3	M12	88	35	33	48	35	13	36	23	13	13	90-99	0.82
TSL-ED 14	14	4	M12	123	37	36	56	38	18	44	26	18	13	90-99	1.27
TSL-ED 16	16	4	M12	123	40	36	57	39	18	45	27	18	13	90-99	1.32
TSL-ED 20	20	5	M12	150	47	44	60	39	21	49	28	21	13	90-99	1.88
TSL-ED 25	25	6	M16	205	56	52	75	45	30	63	33	30	17	170-187	3.05
TSL-ED 32	32	7	M20	255	73	68	91	60	31	77	46	31	22	355-405	7.37
TSL-ED 40	40	9	M20	305	79	73	103	67	36	85	49	36	22	355-405	8.90

Main Applications of the TECNIA Screw Lock Coupler

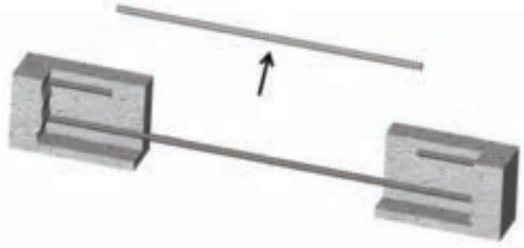
1. Construction columns.
2. Extending or repairing existing structures.
3. Connecting precast elements to each other.
4. Closing access openings.
5. Reinforcement bar cage prefabrication.
6. Fatigue applications.



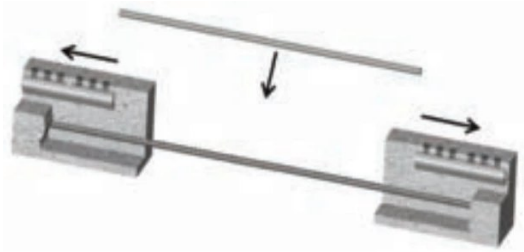


Repair of an Existing Structure

1. To repair an existing structure by replacing a corroded or damaged bar, the replacement bar must be cut approximately 5 mm shorter to ensure clearance for insertion between the ends of the original bars.



2. TSL couplers are pushed fully over both ends of the replacement bar and temporarily tightened in position.



3. The replacement bar is then positioned, and the TSL couplers are moved onto the existing bars by half the length of the coupler.



4. The breaking bolts are then tightened until they shear off.



Installation Instructions for the TSL Coupler

1. Install the TECNIA Screw Lock Coupler on the reinforcement steel from one side.

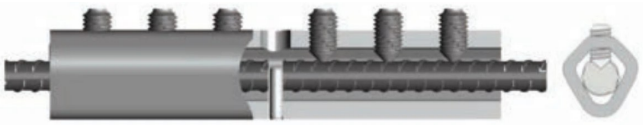


2. Install the second reinforcement bar in the TECNIA Screw Lock Coupler (1) and tighten the breaking bolts until they shear off (2).



3. A pneumatic wrench is necessary for tightening the breaking bolts. Do not add grease to the bolt connection. Screw the bolts in as straight as possible.

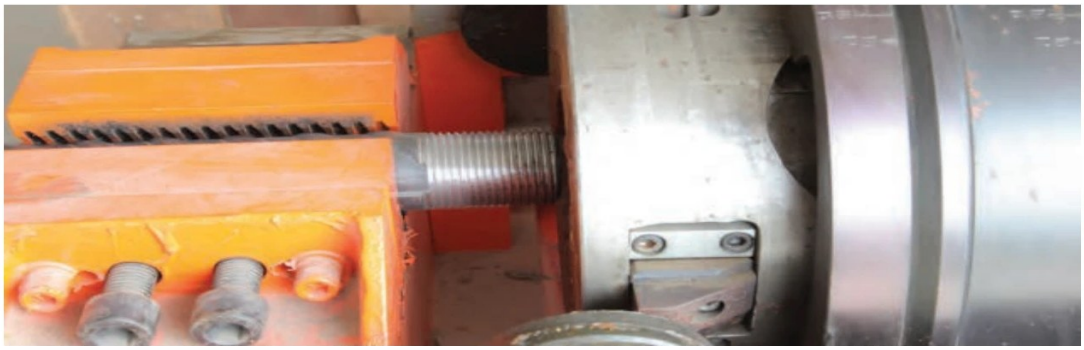
4. The TECNIA Screw Lock Coupler after installation.



Parallel Threaded Coupler DTR

Introduction

The latest parallel thread system (DTR) has been developed and proven to be efficient. The major technological breakthrough is that the thread is made by rolling instead of cutting. Thread rolling is a cold-hardening process and has great advantages over traditional thread cutting.



Features

- **High performance:** the ultimate tensile and compression strength of the rebar can be fully applied with no compromise, satisfying all the major industry standards such as UBC1997, BS8110, NF35-20-1 and DIN1045.
- **Thread rolling, no forging:** the material properties of the rebar (base metal) are kept, and even strengthened, without any change or damage; thread strength is enhanced by the cold rolling process.
- **Two processes,** rib removal and thread rolling, completed on one machine: simple, easy operation and high efficiency.
- **Highly versatile,** suitable for most splicing situations.
- **Short connector length,** cost-effective. The thread end can be made in advance, so installation can be done in any weather conditions, with no power supply required.
- **Easy connection at site,** without the need for a torque spanner.





Advantages of the Thread-Rolling Machine

- **Solid and reliable,** powerful and versatile: one machine covers all rebar sizes from 16 mm to 50 mm.
- **High efficiency:** standard threading on a 32 mm rebar takes only one minute.
- **Two processes,** rib removal and thread rolling, combined and integrated seamlessly.
- **Maximum thread length up to 120 mm.** The thread length is easily set by the length-marking plate; no other adjustments are required.
- **Semi-automatic:** auto feeding once thread rolling starts, and auto reverse after threading is finished.
- **Easy adjustment for different rebar sizes:** the rebar size scale makes adjusting to the right diameter much faster and easier.
- **Easy change of blades and rollers:** the blade base and roller base are easy to take out of the threading head for replacement.



Our machines are available for rent. Please contact our sales team for details.

All major applications use one type of coupler only.



Coupler size & dimensions

Description	Rebar diameter Ø (mm)	Coupler outer diameter (mm)	Coupler length (mm)	Coupler thread M (mm)	Coupler thread pitch (mm)
DTR 12	12	18	34	12.5	2.0
DTR 14	14	21	40	14.5	2.0
DTR 16	16	25	45	16.5	2.5
DTR 18	18	27	50	18.5	2.5
DTR 20	20	30	55	20.5	2.5
DTR 22	22	32	60	22.5	2.5
DTR 25	25	38	65	25.5	3.0
DTR 28	28	42	70	28.5	3.0
DTR 32	32	48	80	32.5	3.0
DTR 36	36	54	90	36.5	3.0
DTR 40	40	61	100	40.5	3.0
DTR 50	50	77	118	50.5	3.5

Note

Special sizes and types are available on request.

Tools & Accessories

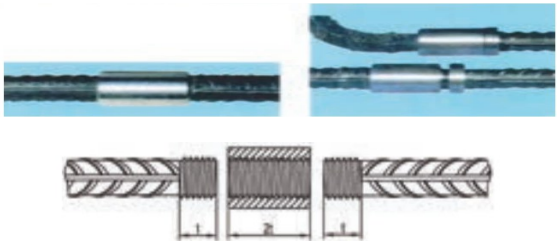
- **Blades** (4 blades/set) are used to remove the rib of the rebar.
- **Threading rollers** (3 rollers/set) are used for thread rolling. Both have proven to have a long life in production worldwide, and with different rebar profiles.
- **Thread gauge:** ensures the rolled thread on the rebar is within the required range.
- **Work spanners:** to tighten the splice at site; no torque spanners required.



Applications

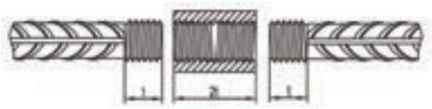
Standard type

Suitable for normal splicing, where the continuation rebar can be rotated.



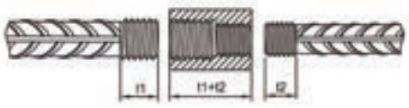
Right / left thread type

Suitable where both rebars are hard to rotate. The thread on one rebar is right-handed and the other left-handed, so the connection can be made by turning the coupler only.



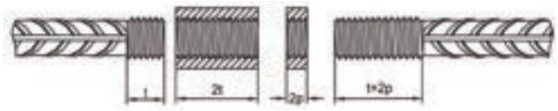
Transit type

The coupler has 2 different thread sizes, one on each end, to connect rebars of different diameters.



Extended with locknut

The thread of one bar is extended to the full coupler length, plus a locknut. Suitable for bars that can be neither rotated nor moved.



> **Note**
> A special machine model is available to produce the extended thread length.

Part 2

Precast Lifting Systems & Accessories

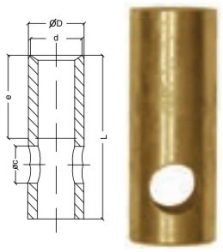
Anchor Sockets & Lifting Loop

Lifting Socket

Lifting sockets are widely used in precast concrete construction, for elements such as beams, wall slabs and floor slabs. A reinforcement bar is inserted through the cross hole to transfer the load into the concrete.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)			
				D	c	e	L
RD 12 x 40	20201	500	RD 12 x 1.75	15.0	8.0	22	40
RD 14 x 47	20205	800	RD 14 x 2.0	18.0	10.5	25	47
RD 16 x 55	20209	1,200	RD 16 x 2.0	21.0	13.0	27	55
RD 18 x 65	20213	1,600	RD 18 x 2.5	24.0	13.0	34	65
RD 20 x 67	20217	2,000	RD 20 x 2.5	27.2	15.5	35	67
RD 24 x 77	20221	2,500	RD 24 x 3.0	31.0	18.0	43	77
RD 30 x 105	20225	4,000	RD 30 x 3.5	39.5	22.5	56	105
RD 36 x 125	2029	6,300	RD 36 x 4.0	47.0	27.2	68	125
RD 42 x 145	20233	8,000	RD 42 x 4.5	54.0	32.0	80	145
RD 52 x 195	20237	12,500	RD 52 x 5.0	67.2	40.0	97	195



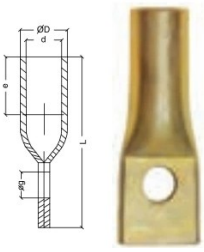
Material: seamless precision tube, galvanized. Stainless steel available on request.

Lifting Insert

The lifting insert is an M-threaded insert for lifting. It can be used to transport beams, panels, slabs and similar elements. A rebar must be passed through the cross hole to transfer the load into the concrete.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)			
				D	L	e	g
M 10 x 50	20101	400	M 10	13.5	50.0	20	10.3
M 12 x 60	20105	500	M12	15.0	60.0	22	10.3
M 16 x 80	20109	1,200	M 16	21.0	80.0	27	13.3
M 20 x 100	20113	2,000	M 20	27.2	100.0	35	16
M 24 x 110	20117	2,500	M 24	31.0	110.0	35	18
M 30 x 155	20121	4,000	M 30	39.5	155.0	50	22.5



Material: seamless precision tube, galvanized. Stainless steel available on request.

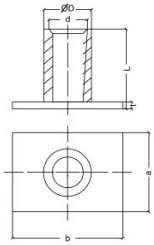
Flat Lifting Socket

The flat lifting socket is ideal for large, thin precast concrete components such as slabs and shells, where normal lifting sockets are hard to place because of the component's small thickness. Additional reinforcement must be used to transmit the load into the concrete.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)				
				D	a	b	t	L
RD 12	20301	500	RD 12 x 1.75	15.0	25	35	4	30
RD 14	20305	800	RD 14 x 2.0	18.0	35	35	4	33
RD 16	20309	1,200	RD 16 x 2.0	21.0	35	50	4	35
RD 18	20313	1,600	RD 18 x 2.5	24.0	45	60	5	44
RD 20	20317	2,000	RD 20 x 2.5	27.2	60	60	5	47
RD 24	20321	2,500	RD 24 x 3.0	31.0	60	80	5	54
RD 30	20325	4,000	RD 30 x 3.5	39.5	80	100	6	72
RD 36	20329	6,300	RD 36 x 4.0	47.0	100	130	6	84
RD 42	20333	8,000	RD 42 x 4.5	54.0	130	130	8	98
RD 52	20337	12,500	RD 52 x 5.0	67.2	130	150	10	117





Material: seamless precision tube and high-strength steel plate.

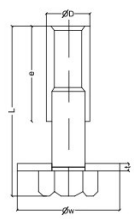
Bolt Anchor with Plate

The TECNIA bolt anchor with plate is suitable for transporting precast concrete components of varying dimensions. Thin flat slabs, facing panels, beams or columns can all be easily transported with TECNIA bolt anchors with plate. The load is transferred into the concrete through the bolt, so generally no additional reinforcement is needed.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)				
				D	L	e	w	t
M 12 x 55	30601	500	M 12 x 1.75	16	55	23	40 x 40	4
M 16 x 75	30605	1,200	M 12 x 1.75	22	75	29	50 x 50	5
M 20 x 90	30609	2,000	M 20 x 2.5	26	90	35	60 x 60	5
M 24 x 110	30613	2,500	M 24 x 3.0	32	110	46	80 x 80	6
M 30 x 140	30617	4,000	M 30 x 3.5	40	140	60	95 x 95	6





Material: seamless precision tube with high-strength bolt.

Solid Rod Socket with Cross Bar

Heavy-duty lifting and fixing sockets for high tensile and shear loads, widely used in precast concrete construction for elements such as lifting beams, wall slabs and floor slabs. The cross bar is factory fitted.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)				
				D	g	e	L	F
M 10 x 42	11001	600	M 10	16	6/8	22	42	50
M 12 x 50	11004	900	M 12	18	10	20	50	75
M 12 x 75	11007	900	M 12	18	10	40	75	75
M 16 x 75	11010	1,700	M 16	23	10/12	40	75	75
M 20 x 75	11013	2,300	M 20	28	12/14	35	75	90
M 24 x 100	11016	3,000	M 24	32	16	55	100	100



Material: high-strength solid bar, galvanized. Stainless steel available on request.
Dimension g (a / b): a = stainless steel pin, b = St 37.2 pin.

Solid Rod Socket

Heavy-duty lifting and fixing sockets for high tensile and shear loads, widely used in precast concrete construction for elements such as lifting beams, wall slabs and floor slabs. A reinforcement bar is inserted through the cross hole to transfer the load into the concrete.

Dimensions & safe working loads at concrete strength of 25 N/mm²

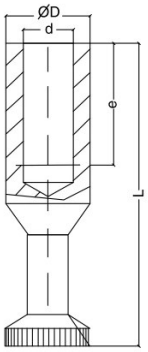
Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)			
				D	g	e	L
M 10 x 42	20401	600	M 10	16	9	22	42
M 12 x 50	20405	900	M 12	18	11	20	50
M 12 x 75	20409	900	M 12	18	11	40	75
M 16 x 75	20413	1,700	M 16	23	14	40	75
M 20 x 75	20417	2,300	M 20	28	16	35	75
M 24 x 100	20421	3,000	M 24	32	18	55	100
M 30 x 125	20425	6,000	M 30	40	22	55	125



Material: high-strength solid bar, galvanized. Stainless steel available on request.

Short Anchor

Short anchors are suitable for lifting lightweight flat units. The advantage is that in most cases no additional reinforcement is needed, as the load is transferred through the crown foot to the concrete.





Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)		
				D	L	e
RD 12 x 50	20601	500	RD 12 x 1.75	17.0	50.0	24
RD 12 x 60	20605	500	RD 12 x 1.75	17.0	60.0	24
RD 14 x 70	20609	800	RD 14 x 2.0	19.0	70.0	28
RD 16 x 80	20613	1,200	RD 16 x 2.0	21.0	80.0	32
RD 18 x 90	20617	1,600	RD 18 x 2.5	24.0	90.0	36
RD 20 x 100	20621	2,000	RD 20 x 2.5	27.0	100.0	40
RD 24 x 115	20625	2,500	RD 24 x 3.0	31.0	115.0	48
RD 30 x 120	20629	4,000	RD 30 x 3.5	40.0	120.0	60
RD 30 x 150	20633	4,000	RD 30 x 3.5	40.0	150.0	60

Material: high-strength steel, galvanized. Stainless steel available on request.

Wavy Tail Anchor

The wavy tail anchor is suitable for transporting very thin-walled precast components such as thin walls and flat panels. Even precast masonry wall components can be transported with this anchor.

Wavy Tail Anchor – Short

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions d x L	Ref. No.	SWL (kg)	Dimensions (mm)		
			L	d1	e
RD 12 x 108	30301	500	108	8	22
RD 14 x 130	30305	800	130	10	25
RD 16 x 167	30309	1,200	167	12	27
RD 18 x 175	30313	1,600	175	14	34
RD 20 x 187	30317	2,000	187	16	35
RD 24 x 240	30321	2,500	240	16	43
RD 30 x 300	30325	4,000	300	20	56
RD 36 x 380	30329	6,300	380	25	68
RD 42 x 450	30333	8,000	450	28	80



Material: seamless precision tube with high-strength rebar.
Stainless steel tube c/w rebar, hot zinc-sprayed.

Wavy Tail Anchor – Long

Dimensions & safe working loads at concrete strength of 25 N/mm²

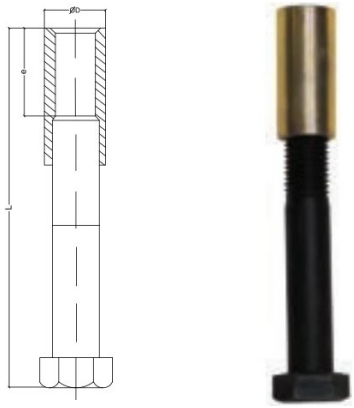
Dimensions d x L	Ref. No.	SWL (kg)	Dimensions (mm)		
			L	d1	e
RD 12 x 137	30401	500	137	8	22
RD 14 x 170	30405	800	170	10	25
RD 16 x 216	30409	1,200	216	12	27
RD 18 x 235	30413	1,600	235	14	34
RD 20 x 257	30417	2,000	257	16	35
RD 24 x 360	30421	2,500	360	16	43
RD 30 x 450	30425	4,000	450	20	56
RD 36 x 570	30429	6,300	570	25	68
RD 42 x 620	30433	8,000	620	28	80



Material: seamless precision tube with high-strength rebar.
Stainless steel tube c/w rebar, hot zinc-sprayed.

Bolt Anchor

The TECNIA bolt anchor is suitable for transporting precast concrete components of varying dimensions. Thin flat slabs, facing panels, beams or columns can all be easily transported with bolt anchors. The load is transferred into the concrete through the bolt, so generally no additional reinforcement is needed.



Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)		
				D	L	e
M 12 x 100	30501	500	M 12 x 1.75	16	100	23
M 16 x 140	30505	1,200	M 12 x 1.75	22	140	29
M 16 x 220	30509	1,200	M 12 x 1.75	22	220	29
M 20 x 135	30513	2,000	M 20 x 2.5	26	135	35
M 20 x 150	30517	2,000	M 20 x 2.5	26	150	35
M 20 x 180	30521	2,000	M 20 x 2.5	26	150	35
M 20 x 270	30525	2,000	M 20 x 2.5	26	180270	35
M 24 x 135	30529	2,500	M 24 x 3.0	32	135	46
M 24 x 170	30533	2,500	M 24 x 3.0	32	170	46
M 24 x 200	30537	2,500	M 24 x 3.0	32	200	46
M 30 x 240	30541	4,000	M 30 x 3.5	40	240	60
M 36 x 300	30545	6,300	M 36 x 4.0	47.5	300	74
M 42 x 300	30549	8,000	M 42 x 4.5	54	300	68

Material: seamless precision tube with high-strength bolt.

Combi Anchor

Suitable for transporting precast concrete components of varying dimensions. Thin flat slabs, facing panels, beams or columns can all be easily transported with the combi anchor. The load is transferred into the concrete through the round foot, so generally no additional reinforcement is needed.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Dimensions d x L	Ref. No.	SWL (kg)	Dimensions (mm)			
			L	d1	e	D
RD 12 x 100	30201	500	100	8	22	22
RD 12 x 174	30205	500	174	8	22	22
RD 14 x 135	30209	800	135	10	25	25
RD 14 x 167	30213	800	167	10	25	25
RD 16 x 150	30217	1,200	150	10	27	27
RD 16 x 195	30221	1,200	195	10	27	27
RD 18 x 170	30225	1,600	170	14	34	35
RD 18 x 275	30229	1,600	275	14	34	35
RD 20 x 190	30233	2,000	190	16	35	40
RD 20 x 235	30237	2,000	235	16	35	40
RD 24 x 210	30241	2,500	21	18	43	40
RD 24 x 260	30245	2,500	260	18	43	40
RD 30 x 270	30249	4,000	270	20	56	50
RD 30 x 390	30253	4,000	390	20	56	50
RD 36 x 330	30257	6,300	330	25	68	60
RD 36 x 440	30261	6,300	440	25	68	60
RD 42 x 450	30265	8,000	450	28	80	70
RD 42 x 540	30269	8,000	540	28	80	70



Material: seamless precision tube with high-strength rebar.
Stainless steel tube c/w rebar, hot zinc-sprayed.

Bar Anchor

The bar anchor is suitable for transporting very thin-walled precast components such as thin walls and flat panels. Even precast masonry wall components can be transported with this anchor.



Dimensions & safe working loads at concrete strength of 25 N/mm²

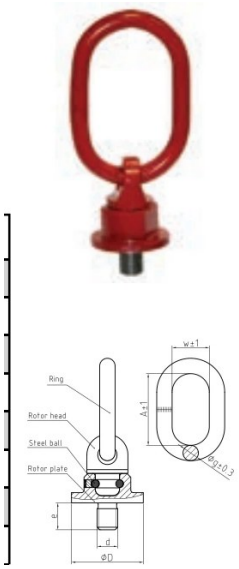
Dimensions d x L	Ref. No.	SWL (kg)	Dimensions (mm)		
			L	d1	e
RD 12 x 190	30101	500	190	8	22
RD 12 x 340	30105	500	340	8	22
RD 16 x 270	30109	1,200	270	10	27
RD 16 x 500	30113	1,200	500	10	27
RD 20 x 350	30117	200	350	16	35
RD 20 x 600	30121	200	600	16	35
RD 24 x 400	30125	2,500	400	18	43
RD 24 x 720	30129	2,500	720	18	43
RD 30 x 540	30133	4,000	540	20	56
RD 30 x 840	30137	4,000	840	20	56
RD 36 x 670	30141	6,300	670	25	68
RD 36 x 980	30145	6,300	980	25	68

Material: seamless precision tube and high-strength rebar.

Swivel Hook

With the TECNIA swivel eye, precast elements can be lifted easily and safely, including under transverse shear. The panel can be lifted easily and safely from horizontal to vertical and vice versa. The pressure plate, with its large support surface, guarantees bearing on the concrete unit. The swivel eye automatically adapts to the direction of inclined forces.

d	D	e	A	w	g
M / Rd 12	47	16	55	35	13
M / Rd 16	56	21	55	35	13
M / Rd 20	70	26	70	60	16
M / Rd 24	74	31	85	75	18
M / Rd 30	90	39	85	90	20
M / Rd 36	101	47	115	100	22
M / Rd 42	110	55	115	100	25
M / Rd 52	130	68	130	140	28



Lifting Loop & Eyebolt

The lifting loop and eyebolt are used for lifting precast concrete elements with precast anchors cast in. The eyebolt can work under both straight-pull and shear-pull loads, while the lifting loop is intended for straight pull only.

Dimensions & recommended safe working loads

Dimensions	Lifting loop Ref. No.	Lifting eyebolt Ref. No.	SWL (kg)	Thread d
RD 12	40101	41201	500	RD 12 x 1.75
RD 14	40104	41204	800	RD 14 x 2.0
RD 16	40107	41207	1,200	RD 16 x 2.0
RD 18	40110	41210	1,600	RD 18 x 2.5
RD 20	40113	41213	2,000	RD 20 x 2.5
RD 24	40116	41216	2,500	RD 24 x 3.0
RD 30	40119	41219	4,000	RD 30 x 3.5
RD 36	40122	41222	6,300	RD 36 x 4.0
RD 42	40125	41225	8,000	RD 42 x 4.5
RD 52	40128	41228	12,500	RD 52 x 5.0



Material: high-strength wire rope with cold-rolled sleeve / forged bolt.

Guidance for Lifting Precast Concrete Elements

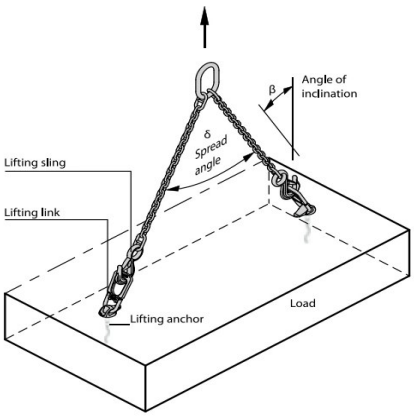
All anchors and lifting links must be designed, calculated and installed according to the instructions in this catalogue.

The system is only suitable for precasting, storing and erecting precast elements.

For long-term use, such as counterweights, please consult TECNIA.

The lifting link must be in a secure position during the lifting operation.

This literature is guidance for professional engineers and precasters. If in doubt, refer to the TECNIA engineering department.



Safety rules

A lifting system consists of the anchors, permanently cast in, and the temporarily attached lifting links. The German association of commercial and industrial workers' compensation insurance carriers has issued "Safety rules for anchors and systems for lifting prefabricated concrete components" (BGR 106), which represent the generally acknowledged state of technology.

These safety rules require the following safety factors:

Safety factors

Steel rupture of anchors	γ = 3
Breakage of concrete cone	γ = 2.5
Failure of lifting links	γ = 4

Identification

All TECNIA anchors and lifting links are clearly marked for the user. The identification markings on the anchor are visible after casting; it is essential to check them before installing the lifting link.

Quality control

Factory quality control is carried out in accordance with DIN EN ISO 9001:2000.

Workmanship

Incorrectly installed lifting anchors or lifting links, or those with damaged parts (for example from corrosion or visible deformation), must not be used. Please contact TECNIA.

To ensure safe use of the TECNIA lifting system, the installation instructions in this catalogue must always be available at the place of use, i.e. in the precast yards and on site. Production management and site management must ensure that personnel are aware of, and have understood, the installation and general safety regulations.

Design Principles

Introduction

Permissible loads, edge distances and reinforcement are shown in the tables in this catalogue.

Special lifting proposals can be provided by the TECNIA technical department. Please contact TECNIA. Software downloads or catalogues can be provided.

The anchors in each load group are offered in a range of designs to suit the concrete shape. Whichever anchor is used, the factors used in the calculation are:

- weight of precast unit
- number of anchors
- positioning of anchors
- angle of lift β
- dynamic forces / crane factor
- adhesion to the mould

The allowance for adhesion to the mould, the angle of lift and the crane shock (dynamic load) are all included in the actual design / selection. Concrete strength has to be assumed at the time of lift.

Edge distances of the anchors are of less importance, as they can normally be solved by special reinforcement.

Weight of precast unit

A specific weight of 25 kN/m³ is to be used as the basis for determining the weight [G] of a fresh reinforced precast unit. A heavy concentration of reinforcement increases the weight, and this should be taken into account by the job engineer.

Adhesion to the mould

When the precast unit is first lifted out of the mould, the required force may be a multiple of the actual concrete weight. This is caused by suction, adhesion and friction between the mould and the concrete unit. From experience, the following adhesion forces can be used:

For smooth, oiled moulds	q = 1 kN/m²
For smooth, non-oiled moulds	q = 2 kN/m²
For rough moulds	q = 3 kN/m²

Adhesion:

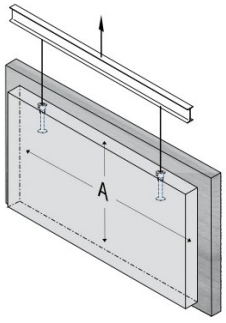
$$H_a = q \times A\ (1)$$

(1) base area of concrete element

π-slabs, ribbed slabs and waffled slabs cause more adhesion:

π-slabs	$H_a = 2 \times G$
Ribbed slabs	$H_a = 3 \times G$
Waffled slabs	$H_a = 4 \times G$

Increased adhesion is caused by vertical parts of the mould that cannot be removed before lifting.



The adhesion should be minimized by removing as many parts of the mould as possible before lifting.

Dynamic forces

The size of the dynamic loading is mainly determined by the choice of lifting equipment.

Cables made of steel or synthetic fibre have a damping effect, which increases with cable length. In contrast, short chains have an adverse effect.

In unfavourable cases, the forces acting on the lifting anchor should be calculated according to the following table.

Crane factors

Lift equipment	Lifting speed [m/min.]	Impact factor ψ
Stationary crane, revolving crane, rail-mounted crane	< 90	1.0 - 1,2
Stationary crane, revolving crane, rail-mounted crane	≥ 90	1.3 - 1,4
Lifting and transporting with excavator on even ground	-	1.5 - 1,65
Lifting and transporting with excavator on uneven ground	-	≥ 2.0

Tensile forces at anchor

The tensile force Z acting on the anchor is normally determined using the following equations:

1. Lifting from the mould:

$$V_1 = G + H_a$$

2. Transporting:

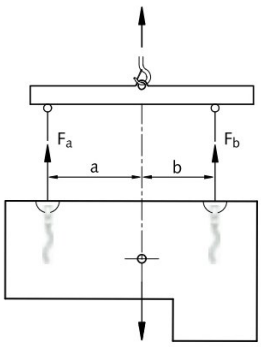
$$V2 = G \times f$$

Anchor Position & Inclination Angle

Anchor positioned asymmetrically

If the anchors cannot be placed symmetrically to the centre of gravity, the load on the anchors must be calculated according to simple static design rules.

Unequal loads on the anchors result from anchors positioned asymmetrically to the centre of gravity:



The load always seeks the position with its centre of gravity under the hook. The real loads for two anchors under a spreader beam can be calculated as follows:

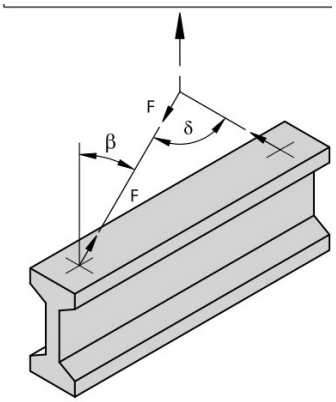
$$F_a = V_{ges} \times b / (a + b)$$

$$F_b = V_{ges} \times a / (a + b)$$

Inclination angle (β)

If a lifting sling is used in a triangle form, the forces acting on the anchors (sling loads) increase compared with simple vertical lifting. As the angle of lift (β) increases, the forces acting on the anchors and slings increase as well. This influence is taken into account by factor ω, dependent on angle β.

$$z = 1 / \cos \beta$$



Spread angle factors

Angle of link β	Spread angle δ	Factor z
0°	-	1.00
7.5°	15.0°	1.01
15.0°	30,0°	1.04
22.5°	45.0°	1.08
30,0°	60,0°	1,16
37.5°	75.0°	1,26
45.0°	90,0°	1,41
52.5°	105.0°	1,64
60,0°	120.0°	2.00

Resulting tension load on the anchor, if the anchors are positioned symmetrically:

$$F = z \times V_{tot} / n$$

n = number of working anchors

Information

To avoid a sloped hanging position of the precast elements, the hook on a spreader beam should be positioned directly above the centre of gravity.

If lifting is carried out without a spreader beam, the anchors should be positioned symmetrically to the centre of gravity.



Multiple Slings

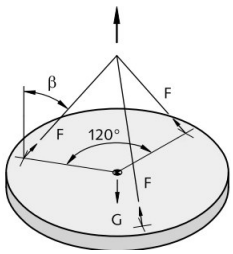
For a beam with more than two suspension points, or a panel with more than three, it is impossible to work out the load per anchor precisely, even if the anchors are arranged symmetrically to the load centre. Because of unavoidable tolerances in the suspension system and in the position of the anchors, it can never be determined whether the load on each anchor is equal.

The use of tolerance-compensating suspension systems (e.g. articulated lifting beam combinations, multiple slings with compensating rig) permits exact load distribution, but these should only be used by experienced specialists. Bear in mind that such a system must be used both in the yard and on site. In case of doubt, only two anchors should be assumed to be load-bearing (BGR 500 Ch. 2.8 Point 3.5.3).

The use of two anchors is recommended for beams and upright panels, and four anchors installed symmetrically to the load centre are recommended for horizontal slabs. In both instances, it can be assumed that two anchors will bear equal loads.

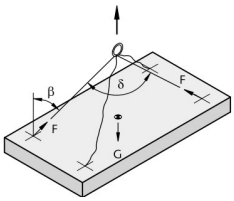
Examples

The use of three anchors ensures that the static load is shared evenly.



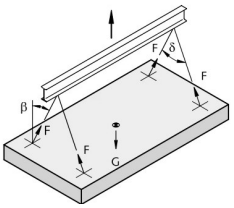
Number of load-bearing anchors: n = 3

For an arrangement of four independent cable runs, or continuous diagonal cable runs, only two anchors can be assumed to be load-bearing.



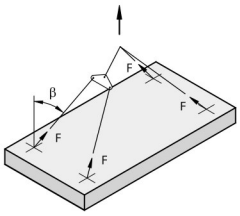
Number of load-bearing anchors: n = 2

A perfect static weight distribution can be obtained by using a spreader beam and two pairs of anchors set out symmetrically.



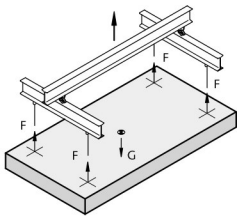
Number of load-bearing anchors: n = 4

The system with a compensating rig makes it possible to distribute the load evenly over 4 anchors.



Number of load-bearing anchors: n = 4

A perfect static weight distribution can be obtained using a crossed spreader beam, which avoids angled pull.



Number of load-bearing anchors: n = 4

Example: Slab Unit

Example slab unit

When selecting the anchor, a distinction can be made between the situation in the manufacturing yard and on the construction site. Avoid selecting an anchor that is too large by including too many factors.

Example slab unit: lifting, and transporting in the yard and on site.

Lifting from the mould (demoulding):

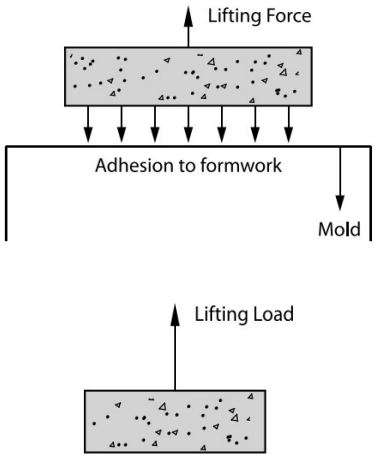
$$F = (G + q \times A) \times z / n$$

Transport in the yard:

$$F = G \times f \times z / n$$

Transport on the site:

$$F = G \times f \times z / n$$



Calculation parameters for this example

Example slab unit		Manufacturing plant		On site
		Lifting	Transport	
G	Mass	10 t (≈ 100 kN)		10 t (≈ 100 kN)
A	Mould area	20 m²		-
q	Adhesion to formwork	2 kN/m²	-	-
f	Lifting load coefficient	-	1,1	1,4
z	Cable angle factor	1.04 (β = 15°)		1,41 (β = 45°)
β_W	Concrete strength	15 N/mm²		35 N/mm²

With 2 supporting anchors, the angled pull force F per anchor is as follows:

Lifting from the mould (demoulding):

$$F = (100\ kN + 2\ kN/m2 \times 20\ m2) \times 1.04 / 2 = 72{,}8\ kN$$

Transport in the yard:

$$F = 100\ kN \times 1{,}1 \times 1.04 / 2 = 57{,}2\ kN$$

Transport on the site:

$$F = 100\ kN \times 1{,}4 \times 1{,}41 / 2 = 98{,}7\ kN$$

An anchor in the 10 t load range is just adequate.

If all detrimental factors were included, the result would be:

$$F = (100\ kN + 20\ m2 \times 2\ kN/m2) \times 1{,}4 \times 1{,}41 / 2 = 138\ kN$$

i.e. an anchor in load group 15 would have to be used.

The loads occurring on site are often higher than in the manufacturing plant, as a result of greater cable spread and possibly higher crane factors. However, the concrete strength is usually higher, i.e. the anchor's load capacity in the concrete is higher.

In the above example, the result for a lifting anchor would be as follows:

At the yard (β_W = 15 N/mm², cable angle 15°): angled pull 15° ≤ 30°

- full permissible load at angled pull, even with β_W = 15 N/mm²

On the site (β_W = 35 N/mm², cable angle 45°): angled pull 45° > 30°

- full permissible load at angled pull for concrete strength of β_W = 35 N/mm² > 23 N/mm², with angled pull reinforcement

Fixing Sockets & Cast-in Loop

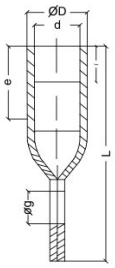
Fixing Socket Dowel

Fixing inserts are used for fixing lightweight precast concrete units. A reinforcement tail must be used to transmit the load into the concrete. Fixing inserts must not be used for lifting under any circumstances.

Dimensions & recommended safe working loads

Description	Ref. No.	SWL (kg)	Thread M	Dimensions (mm)				
				D	L	f	e	g
M 8 x 40	10101	200	8	11	40	15	8	8.2
M 8 x 50	10105	250	8	11	50	20	8	8.2
M 10 x 50	10109	350	10	13	50	20	10	9.2
M 10 x 60	10113	450	10	13	60	25	10	9.2
M 12 x 60	10117	500	12	16	60	25	12	10.2
M 12 x 70	10121	600	12	16	70	30	12	10.2
M 14 x 70	10125	700	14	19	70	25	14	12.2
M 14 x 80	10129	700	14	19	80	30	14	12.2
M 16 x 70	10133	700	16	22	70	25	16	12.2
M 16 x 80	10137	800	16	22	80	25	16	12.2
M 16 x 100	10141	1,000	16	22	100	30	16	12.2
M 20 x 100	1045	1,250	20	27	100	40	20	14.2
M 20 x 120	10149	1,250	20	27	120	40	20	14.2
M 24 x 120	10153	1,700	24	32	120	50	24	14.2
M 27 x 135	10157	2,200	27	36	135	60	27	17.2
M 30 x 150	10161	2,600	30	42	150	70	30	17.2





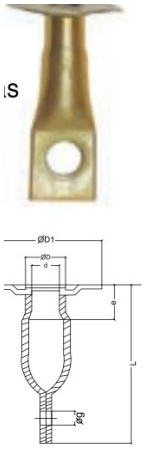
Material: seamless precision tube, galvanized. Stainless steel available on request.

Fixing Insert with Nailing Plate

The fixing insert with nailing plate is used for fixing lightweight precast concrete units. It can be nailed to wooden formwork through the nailing plate. A reinforcement bar must be inserted through the cross hole to transmit the load into the concrete.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Description	Ref. No.	SWL (kg)	Thread M	Dimensions (mm)				
				D	D1	e	g	L
M 10 x 60	10201	450	M 10	13	48	10	10.3	60
M 12 x 70	10205	600	M 12	16	48	12	12	70
M 16 x 100	10209	1,000	M 16	22	48	15	12	100
M 20 x 100	10213	1,300	M 20	27	48	18	14	100
M 24 x 105	10217	1,600	M 24	32	48	21	14	105



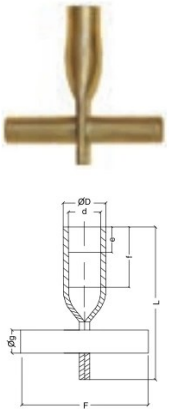
Material: seamless precision tube, galvanized. Stainless steel available on request.

Fixing Insert with Cross Bar

The fixing insert with cross bar transfers forces into the concrete directly through the cross pin, instead of an additional reinforcement bar.

Dimensions & safe working loads at concrete strength of 25 N/mm²

Description	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)					
				D	L	f	e	g	F
M 8 x 55	10301	250	M 8	11	55	20	8	8	50
M 10 x 60	10304	450	M 10	13	60	23	10	10	70
M 12 x 60	10307	500	M 12	16	60	23	12	12	70
M 16 x 80	10310	1,000	M 16	22	80	30	15	12	100
M 16 x 100	10313	1,000	M 16	22	100	50	15	12	100
M 16 x 120	10316	1,000	M 16	22	120	70	15	12	100
M 20 x 95	10319	1,250	M 20	27	95	35	18	14	120
M 20 x 115	10322	1,250	M 20	27	115	55	18	14	120
M 24 x 120	10325	1,700	M 24	32	120	40	21	14	150



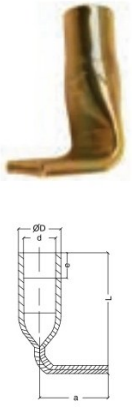
Material: seamless precision tube, galvanized. Stainless steel available on request.

Fixing Insert with Bent End

The fixing insert with bent end is used for fixing lightweight precast concrete units. It is easy to use, because no reinforcement bar is required.

Dimensions & safe working loads at concrete strength of 25 N/mm²

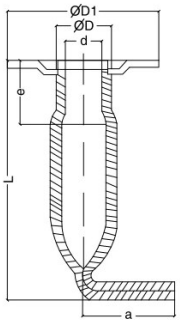
Description	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)			
				D	L	e	a
M 8 x 50 / 20	10401	300	M 8	11	50	8	20
M 10 x 60 / 25	10405	600	M 10	13	60	10	25
M 12 x 45 / 25	10409	400	M 12	16	45	12	25
M 12 x 70 / 30	10413	800	M 12	16	70	12	30
M 16 x 60 / 30	10417	800	M 16	22	60	16	30
M 16 x 100 / 35	10421	1,300	M 16	22	100	16	35
M 20 x 70 / 30	10425	1,200	M 20	27	70	20	30
M 20 x 100 / 35	10429	1,600	M 20	27	100	20	35
M 24 x 80 / 35	10433	1,600	M 24	32	80	24	35



Material: seamless precision tube, galvanized. Stainless steel available on request.

Fixing Insert with Bent End and Nailing Plate

The fixing insert with bent end and nailing plate is used for fixing lightweight precast concrete units. It can be nailed to wooden formwork through the nailing plate, and it is easy to use because no reinforcement bar is required.





Dimensions & safe working loads at concrete strength of 25 N/mm²

Description	Ref. No.	SWL (kg)	Thread d	Dimensions (mm)				
				D	D1	e	a	L
M 10 x 60 / 25	10501	600	M 10	13	48	10	25	60
M 12 x 70 / 30	10505	800	M 12	16	48	12	30	70
M 16 x 100 / 35	10509	1,300	M 16	22	48	16	35	100
M 20 x 100 / 35	10513	1,600	M 20	27	48	20	35	100
M 24 x 80 / 35	10517	1,600	M 24	32	48	24	35	80

Material: seamless precision tube, galvanized. Stainless steel available on request.

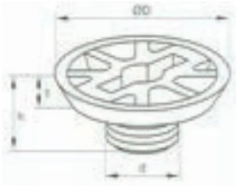
Precast Accessories

Plastic Nailing Plate

The plastic nailing plate is used to fix the anchor sockets to the formwork. Thread sizes M/Rd 12 to M/Rd 52 are available. The nailing plate is made of plastic and is colour-coded according to the thread size. It allows the head of the lifter to bear on the concrete during diagonal and transverse lifting.

Dimensions d	Ref. No.	Dimensions (mm)			Colour
		L	h	t	
M / Rd 10	40201	25	20	10	Blue
M / Rd 12	40205	25	20	10	Orange
M / Rd 14	40209	25	20	10	White
M / Rd 16	40213	25	20	10	Red
M / Rd 18	40217	55	25	10	Pink
M / Rd 20	40221	55	25	10	Light grey
M / Rd 24	40225	55	25	10	Black
M / Rd 30	40229	70	30	10	Black-green
M / Rd 36	40233	70	30	10	Blue
M / Rd 42	40237	95	34	12	Light grey
M / Rd 52	40241	95	34	12	Yellow



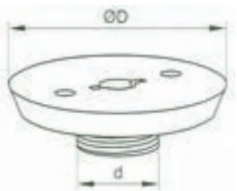


Steel Nailing Plate

The steel nailing plate is used to fix the socket anchors to the formwork. Thread sizes M/Rd 18 to M/Rd 52 are available. The nailing plate is made of steel and allows the head of the lifter to bear on the concrete during diagonal and transverse lifting.

Dimensions d	Ref. No.	Dimensions (mm) D
M / Rd 18	40301	58
M / Rd 20	40305	70
M / Rd 24	40309	70
M / Rd 30	40313	70
M / Rd 36	40317	95
M / Rd 42	40321	95
M / Rd 52	40325	95



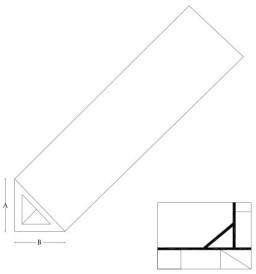


Chamfer

Made from impact-strength PVC for sufficient hardness and workability. Standard length 2 m, or 2.5 m on request.

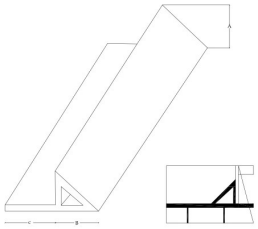
CF type

Item No.	Size (mm)	
	A	B
CF 6	6	6
CF 11	11	11
CF 15	15	15
CF 20	20	20
CF 22	22	22
CF 24	24	24
CF 25	25	25
CF 28	28	28
CF 30	30	30
CF 50	50	50



CFN type

Item No.	Size (mm)		
	A	B	C
CFN 6	6	6	10
CFN 11	11	11	10
CFN 15	15	15	15
CFN 20	20	20	20
CFN 22	22	22	20
CFN 24	24	24	20
CFN 25	25	25	20



Standard and magnetic steel chamfer

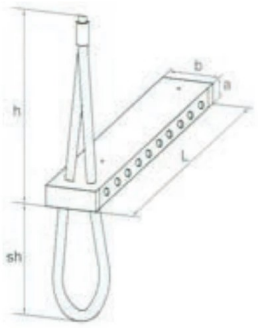
Item No.	Size (mm)		
	A	B	C
S CF 10	10	10	14
S CF 15	15	15	21
S CF 20	20	20	28
S CF 25	25	25	35



Fixing Box

The fixing box is designed for simple and safe fixing of precast concrete components. It is easy to install by simply attaching it to the reinforcement, and it can be used in the thinnest wall thicknesses. The components can be transported efficiently and safely using an additional lifting device.

Description	Ref. No.	Dimensions (mm)				
		a	b	L	h	sh
LB 80	50201	20	50	160	212	80
LB 100	50204	20	50	160	212	100
LB 120	50207	20	50	160	212	120





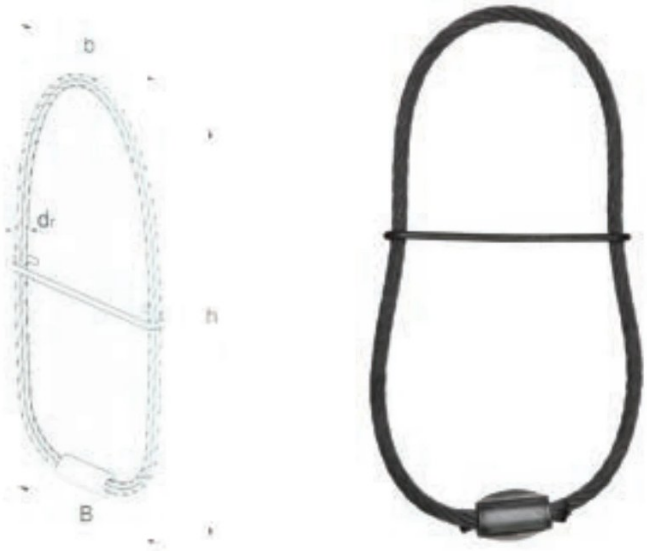
Shim Pad

Size	Thickness
70 x 70	2 mm
70 x 70	3 mm
70 x 70	5 mm
70 x 70	10 mm



Cast-in Loop

Cast-in loops are mainly used for large volumes of concrete, such as beams or foundations.



Dimensions & safe working loads at concrete strength of 25 N/mm²

Description	Ref. No.	SWL (kg)	Dimensions (mm)			
			h	B	b	dr
NC 08	50101	800	205	95	85	6
NC 12	50105	1,200	230	100	90	7
NC 16	50109	1,600	250	130	125	8
NC 20	50113	2,000	300	135	125	9
NC 25	50117	2,500	325	140	125	10
NC 40	50121	4,000	370	165	145	12
NC 52	50125	5,200	380	180	145	14
NC 63	50129	6,300	425	235	200	16
NC 80	50133	8,000	480	235	235	18
NC 100	50137	10,000	535	265	235	20
NC 125	50141	12,500	590	280	245	22

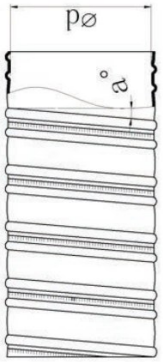
Spiral Pipe

Technical data: post-tensioning

Material and application

The post-tensioning pipe is made of zinc-plated or non-zinc-plated mild steel strips. The steel strips are spiralled and locked with an overlap joint by a rolling process. The pipe is used to form ducts in post-tensioned prestressed concrete structures and components.





Parameters of post-tensioning pipe

Bore diameter d (mm)	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110
Allowable deviation	+ 0.5													+ 1.0	
Width of strips (mm)	36														
Thickness of strips (mm)	0.25 - 0.3 (+ / - 0.02)														
Spiral angle a°	10°49'	9°38'	8°41'	7°55'	7°16'	6°43'	6°14'	5°49'	5.28	5°08'	4°51'	4°36'	4°22'	4°10'	3°58'
Mandrel diameter	22	22	35	35	35	353	35	35	35	35	35	35	35	35	35
Spiral guider diameter (mm)	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110
Pipe die diameter (mm)	40	45	50	55	60	65	70	75	80	85	90	95	100	105	111
Number of gear teeth	27	30	33	36	39	42	45	49	52	55	58	61	65	68	70
Point load (N)	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Even load (N)	496	628	775	938	1,116	1,310	1,519	1,744	1,984	2,240	2,511	2,798	3,100	3,418	3,751
Deformation (mm)	<8	<9	<10	<11	<12	<13	<14	<15	<16	<17	<18	<19	<20	<21	<22

Part 3

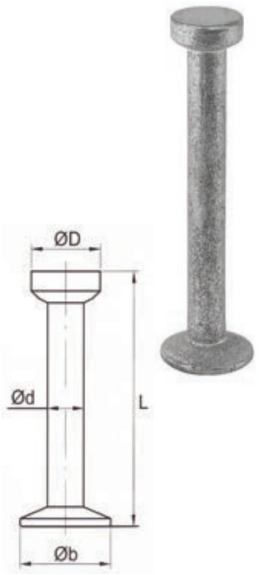
Spherical Lifting System & Accessories

Lifting Stud

The lifting stud is suitable for lifting precast concrete pipes and slabs. The round foot transfers the load into the concrete, reaching a high permissible load even with a relatively short anchor length. Longer lengths are used for reduced edge distances or reduced concrete strengths.

Dimensions & load class

Load class (ton)	Ref. No.	Dimensions (mm)			
		L	D	d	b
1.3	70101	55	19	10	25
1.3	70105	65	19	10	25
1.3	70109	85	19	10	25
1.3	70113	120	19	10	25
2.5	70117	55	26	14	35
2.5	70121	85	26	14	35
2.5	70125	120	26	14	35
2.5	70129	170	26	14	35
5	70133	75	36	20	50
5	70137	95	36	20	50
5	70141	120	36	20	50
5	70145	240	36	20	50
7.5	70149	120	47	24	60
7.5	70153	164	47	24	60
10	70157	120	47	28	70
10	70161	170	47	28	70
20	70165	340	69	38	98
20	70169	500	69	38	98
20	70173	1000	69	38	98
32	70177	320	88	50	135
32	70181	700	88	50	135
32	70185	200	88	50	135
45	70189	500	88	50	135
45	70193	1200	88	50	135



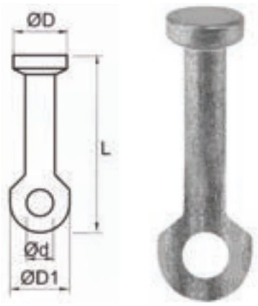
Material: high-strength steel, black or galvanized.

Lifting Stud with Foot Eye

The lifting stud with foot eye is mainly designed for use in slender reinforced concrete elements, e.g. beams and girders. It is also suitable for lightweight concrete elements; please take the reduced bond stresses into account.

Dimensions & load class

Load class (ton)	Ref. No.	Dimensions (mm)			
		D	d	D1	L
1.3	70101	19	10	19	65
2.5	70105	26	14	27	90
5	70109	36	20	42	120
10	70113	46	28	57	180
20	70117	69	38	76	250

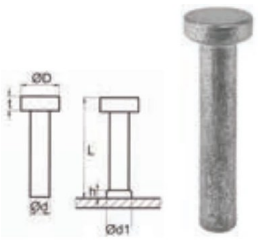


Material: high-strength steel, black or galvanized.

Shear Stud

The shear stud can be used as a simple concrete anchor to provide a permanent bond between steel and concrete, such as in concrete encasement of steel beams, piling walls and coffer dams. It can also be welded through metal decking to provide the required bond between the steel beams and the cast-in-situ concrete floor.

Description	Ref. No.	Dimensions (mm)					
		L	d	D	d1	t	h
SD06	70201	50-100	6.35	12.7	9.7	4.7	3
SD10	70205	50-175	9.52	19	12.5	7.1	4
SD13	70209	50-175	12.7	25.4	17	8	5
SD16	70213	50-175	15.8	31.7	21	8	7
SD19	70217	50-175	19	31.7	24	10	9
SD22	70221	50-200	22.2	34.9	28	10	10



Material: high-strength steel, black or galvanized.

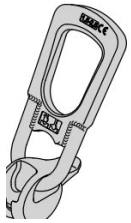
Universal-Head Lifting Link

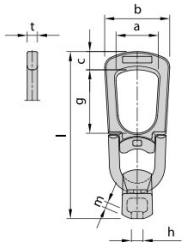
The TECNIA universal-head lifting link is an attachment link for lifting and transporting precast concrete units in combination with the spherical head anchor. It is manually operated and is manufactured in the versions given in the following table. The allowable loads for individual cases must be checked using the tables for each anchor type.

Dimensions of universal-head lifting link

Load class (ton)	Ref. No.	Weight (kg)	Dimensions (mm)							
			a	b	c	g	h	t	l	m
1.3	00001	0.9	47	75	20	71	11	12	188	7.0
2.0 and 2.5	00002	1.4	59	91	25	86	16	14	230	8.5
3.0 and 5.0	00003	3.4	70	118	37	88	21	16	283	10.0
6.0 and 10.0	00004	9.1	88	160	50	115	30	25	401	14.0
12.0 and 20.0	00005	21.0	106	180	75	135	41	30	506	21.0
32.0	00006	47.0	172	272	100	189	52	40	680	28.5
45.0	00007	59.0	179	349	100	192	52	40	676	28.5







Round Recess Former

Round rubber recess formers are produced from shape-stable, oil- and temperature-resistant (120 deg) rubber and can be used repeatedly. To ease identification of the load groups, the formers are produced in different colours.

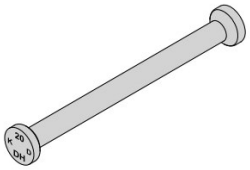
Description	Ref. No.	SWL (kg)	Dimensions (mm) R	Colour
RF 30 x 13	2206030013	1,300	30.0	Blue
RF 37 x 25	2206037025	2,500	37.0	Yellow
RF 47 x 40	2206047040	4,000	47.0	Black
RF 47 x 50	2206047050	5,000	47.0	Blue
RF 59 x 75	2206059075	7,500	59.0	Red
RF 59 x 100	2206059100	10,000	59.0	Yellow
RF 80 x 150	2206080150	15,000	80.0	Grey
RF 80 x 200	2206080200	20,000	80.0	Black
RF 107 x 320	2206080320	32,000	107.0	Black

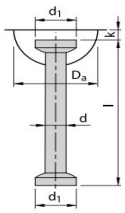


Narrow Foot Spherical Head Anchors

Dimensions, load capacity and reinforcement

This anchor is used in prestressed beams. Because of the good concrete strength at lifting, and the thin web in most cases, the small foot is easier to use.





Dimensions of narrow foot spherical head anchors

Load class (ton)	Ref. No.	Dimensions (mm)				
		l	d	d1	k	D_a
10.0	00056	340	28	46	15	118
15.0	00057	400	34	69	15	160
20.0	00067	500	38	69	15	160
32.0	00058	700	50	88	23	214

Load capacity for axial pull and angled pull up to β = 45°

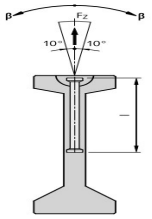
Load class (ton)	Web thickness 2 x e_r (mm)	Distance between anchors e_z (mm)	Axial pull and angled pull up to 45° [β] · Load capacity (kN) · Concrete strength	
			45 N/mm²	55 N/mm²
10.0	120	≥ 1360	88.0	98.0
15.0	120	≥ 1600	130.0	145.0
20.0	120	≥ 2000	136.0	151.0
20.0	140	≥ 2000	173.0	192.0
32.0	120	≥ 2800	189.0	210.0
32.0	140	≥ 2800	220.0	245.0

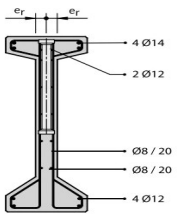
Note

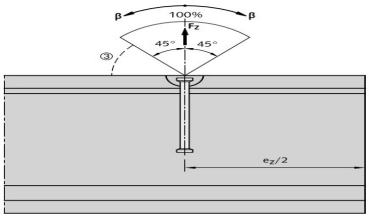
Minimum reinforcement is shown in the drawing below.

Warning

Angled pull with β > 60° caused by the spread of cables or chains is not permitted.







MEHNA

MEHNA for Engineering Solutions and Machine Manufacturing

Amman Development Corridor, Exit 9, Sahab, Amman, Jordan

+962 77 802 2244 · info@mehnajo.com · www.mehnajo.com

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