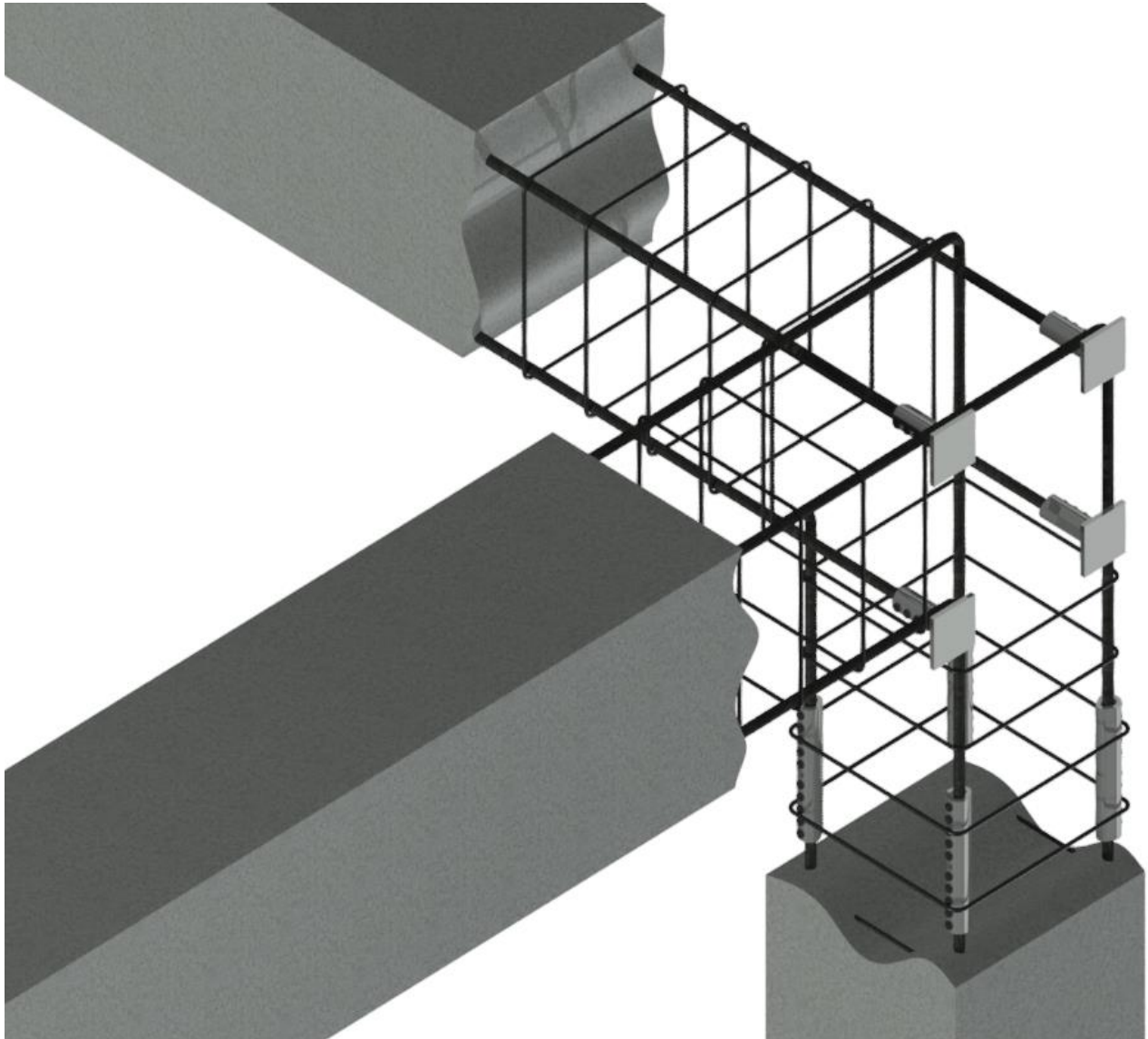




ALLIGATOR COUPLERS



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PRODUCT RANGE

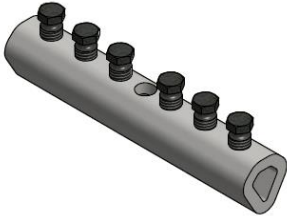
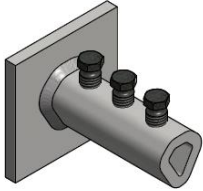
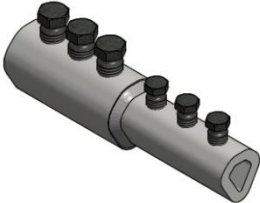
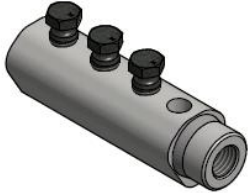
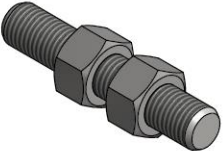





COUPLERS		
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INTRODUCTION

The ALLIGATOR coupler is used for splicing any grade or profile of reinforcing steel bar. These couplers are made of reinforcement steel with diameters in the range of 10 mm to 40 mm. Connection is made by inserting bars into both ends of the coupler. The breaking bolts are then screwed on by hand and tightened with a ratchet wrench until the bolts shear off. In specific cases, these couplers can be used to replace the damaged reinforcements with new ones and to connect to the old structure.

The advantages of ALLIGATOR COUPLERS are as follows:

- Ensure integral connection for steel reinforcement.
- There is no need for threading or any other bar preparation.
- They are fast, simple and easy to use.
- The use of ALC rules out the use of lap splices resulting in less congestion and the saving of rebar material.
- No special training needed.
- Do not have any welded components.
- Correct assembly is easy to check visually.

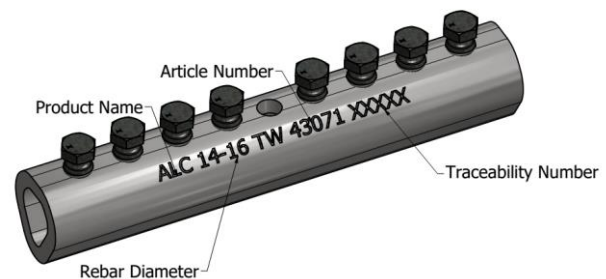
Quality

Terwa continuously controls the connection production process from the perspective of strength, dimensional and material quality and performs all of the required inspections for a superior quality system. All of the products are tracked from material acquisition to the final, ready to use product.



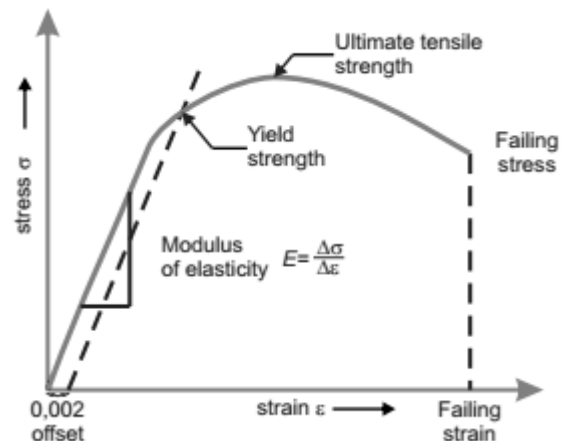
Marking and traceability

All systems have all necessary data for traceability, rebar diameter and product name.



Coupler testing

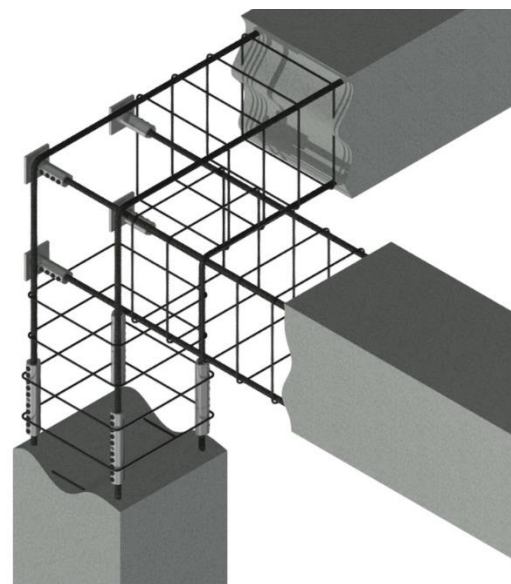
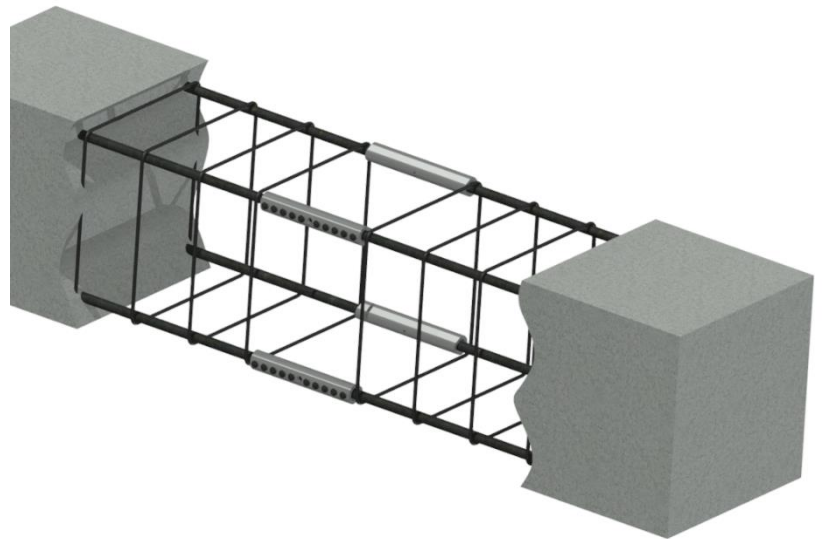
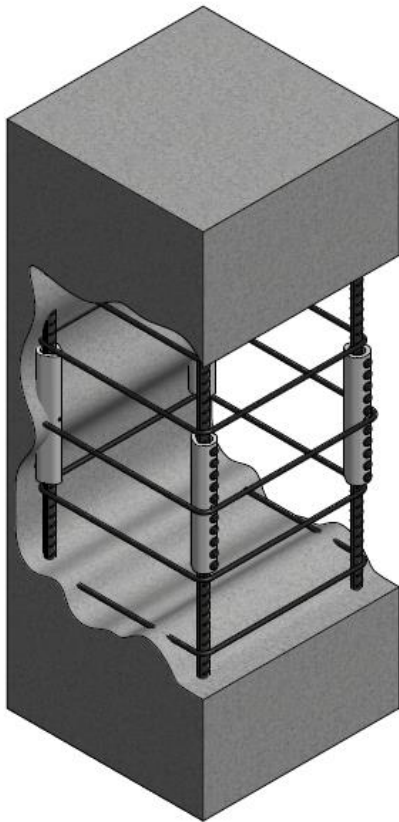
Terwa rebar couplers are designed to ensure the full transfer of the load to the reinforcement steel and a slip value under 0.1 mm. Terwa periodically tests the system for this in the factory according to the European standards.





THE MAIN APPLICATIONS FOR ALLIGATOR COUPLERS

- for column construction
- to extend or repair existing structures
- to connect precast element to precast element
- to close access openings
- for the pre-fabrication of the reinforcing bar cage
- for fatigue applications

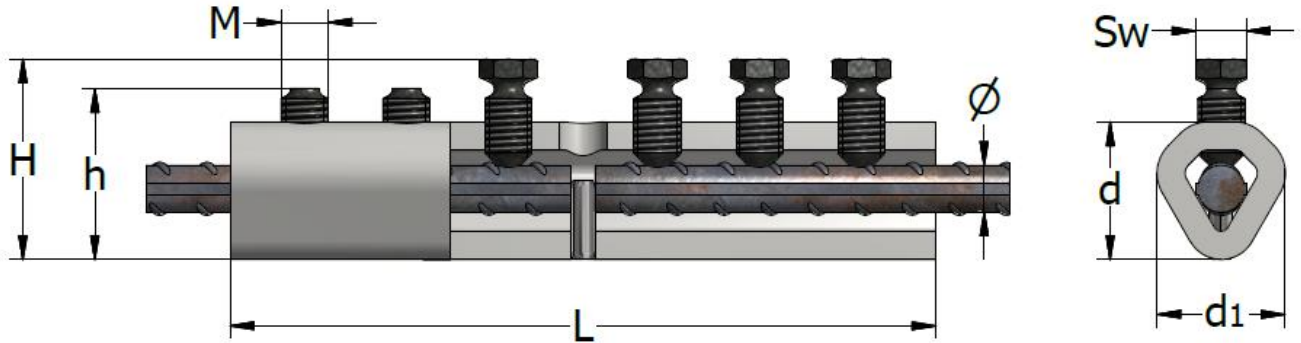




ALLIGATOR COUPLING – ALC

The ALLIGATOR COUPLING ALC is used for the connection of reinforcing bars of the same size. The product has a pin and an inspection hole in the middle for correct installation. The breaking bolts are designed to shear off at the torque moment specified in the table below.

Tighten the bolts using a torque wrench, an impact, electric or pneumatic wrench. Please see page 18-19.

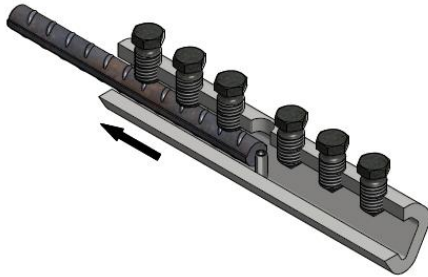


Type ALC	Product no.	Rebar Ø [mm]	Breaking bolt		Breaking bolt thread M	L [mm]	d [mm]	d1 [mm]	H Unruptured Bolt [mm]	h [mm]	SW [mm]	Torque moment [Nm]
			n	Product no.								
10	44633	10	6	50685-1	M12	160	35	33	Max. 48	38	13	100-115
12	44634	12	6	50685-1	M12	180	35	33	Max. 51	41	13	100-115
14-16	43071	14/16	8	50685-1	M12	230	40	36	Max. 56/58	46/48	13	100-115
18	43072	18	10	50685-1	M12	280	44	42	Max. 59	49	13	100-115
20	43073	20	10	50686-1	M16	260	47	44	Max. 66	54	17	195-215
22	43074	22	10	50686-1	M16	330	53	50	Max. 70	58	17	195-215
25	43075	25	12	50686-1	M16	390	56	52	Max. 73	61	17	195-215
26	63079	26	12	52295	M20	420	66	62	Max. 86	71	22	355-405
28	43076	28	12	52295	M20	420	66	62	Max. 88	73	22	355-405
30	63080	30	14	52295	M20	480	73	68	Max. 90	75	22	355-405
32	43077	32	14	52295	M20	480	73	68	Max. 95	80	22	355-405
36	43078	36	16	52295	M20	540	79	73	Max. 101	86	22	355-405
40	43079	40	18	52295	M20	580	79	73	Max. 104	89	22	355-405



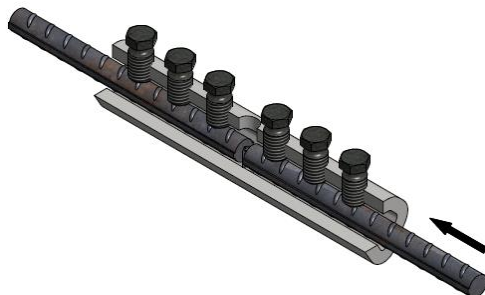
MOUNTING INSTRUCTIONS FOR ALC COUPLER

- Mount the ALLIGATOR COUPLER to the reinforcement steel from one side.

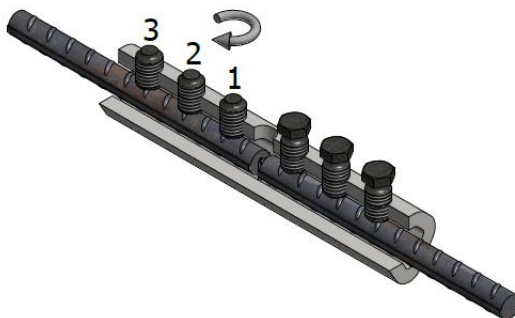


-Place the ALC coupler over the end of first rebar and tighten the breaking bolt by hand.
- It is important to check the contact between the first rebar and the central stopper pin (visible through the inspection hole).

- Mount the second reinforcement bar in the ALLIGATOR COUPLER and tighten the breaking bolts until it shears off.



-Insert the second rebar into the coupler.
- Check the contact between the second rebar and the pin.
-Do not lubricate the bolt connection.
-Tighten the breaking bolt by hand.



Tighten the breaking bolts completely using an electric or pneumatic wrench as on page 18-19. The bolts must be tightened from the centre outwards (1 to 3) until the heads of all the breaking bolts shear off.

- The ALLIGATOR COUPLER in its mounted state.



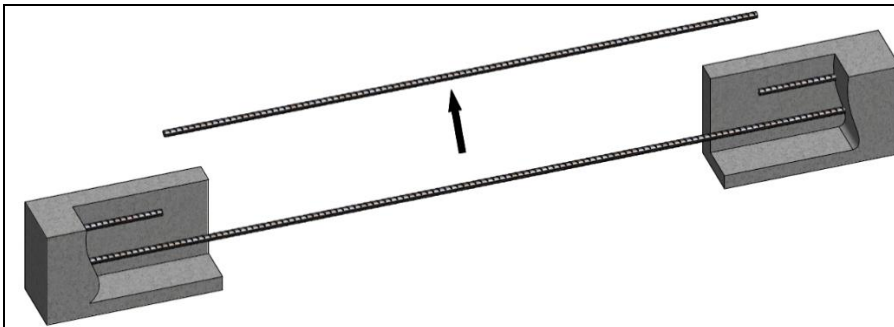
Completed Alligator (ALC) coupler installation after all bolts have been sheared off. Not removing/shearing of a bolt head during installation is acceptable provided the appropriate bolt torque is attained as detailed in the table on page 6. However, the installation is only considered satisfactory if the height H as shown in the table on page 6 is not exceeded. This must be measured to ensure satisfactory penetration and grip of the reinforcing bar.

Note: When there is not enough space in the element to use a pneumatic or electric wrench, a torque hand wrench can be used to shear the bolt or to achieve the torque momentum according to the table on page 6. Using a torque multiplier for breaking bolts M16 and M20 is recommended.

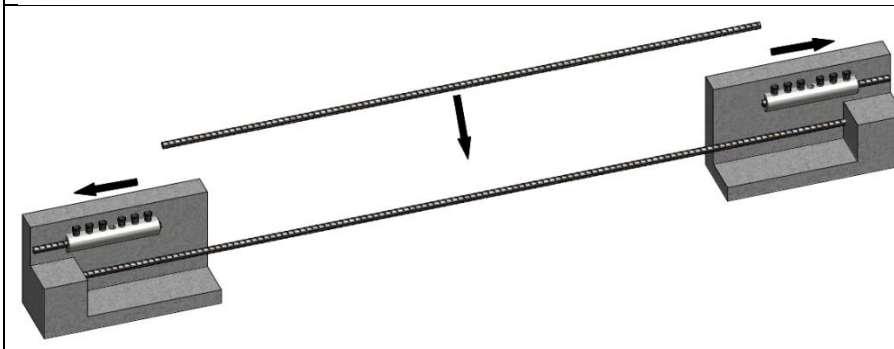
The ALC are delivered with the Breaking Bolts pre-mounted and should not be removed from the coupler. The wrench momentum has to be at least **2x the bolt torque**.



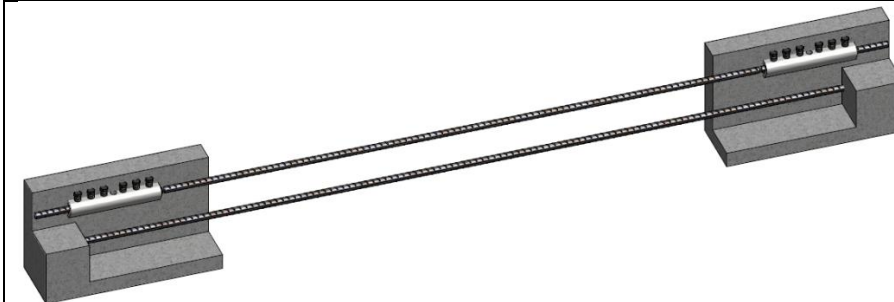
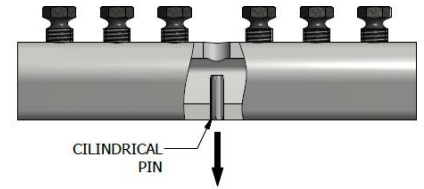
MOUNTING INSTRUCTIONS FOR AN ALC ALLIGATOR COUPLER – REPAIR OF AN EXISTING STRUCTURE.



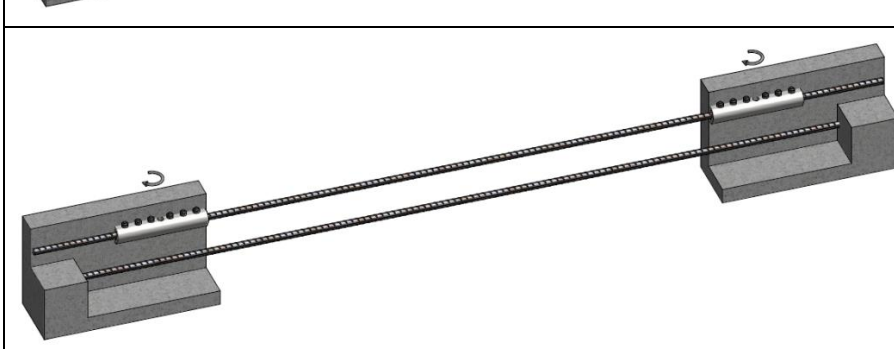
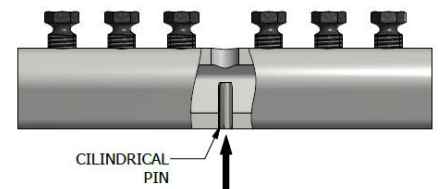
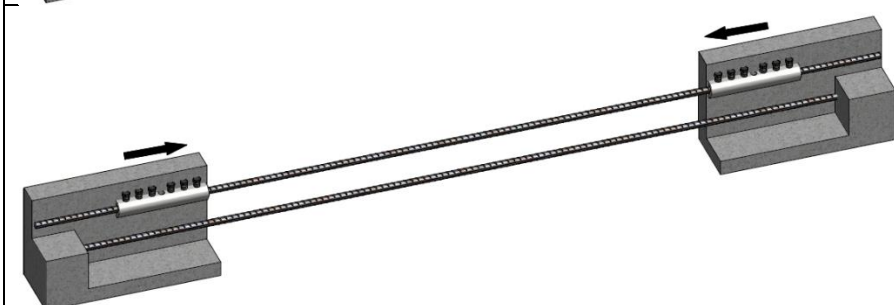
To repair an existing structure by replacing a corroded or damaged bar, the replacement bar must be cut approximately 5mm shorter to ensure clearance for insertion between the ends of the original bars.



ALC couplers are pushed fully over both ends of the existing bars and temporarily tightened into position. First remove the pin from the ALC.



Then shift the position of the replacement bar and the ALC couplers on the replacement bar by half the length of the coupler. Remount the pin in the ALC.

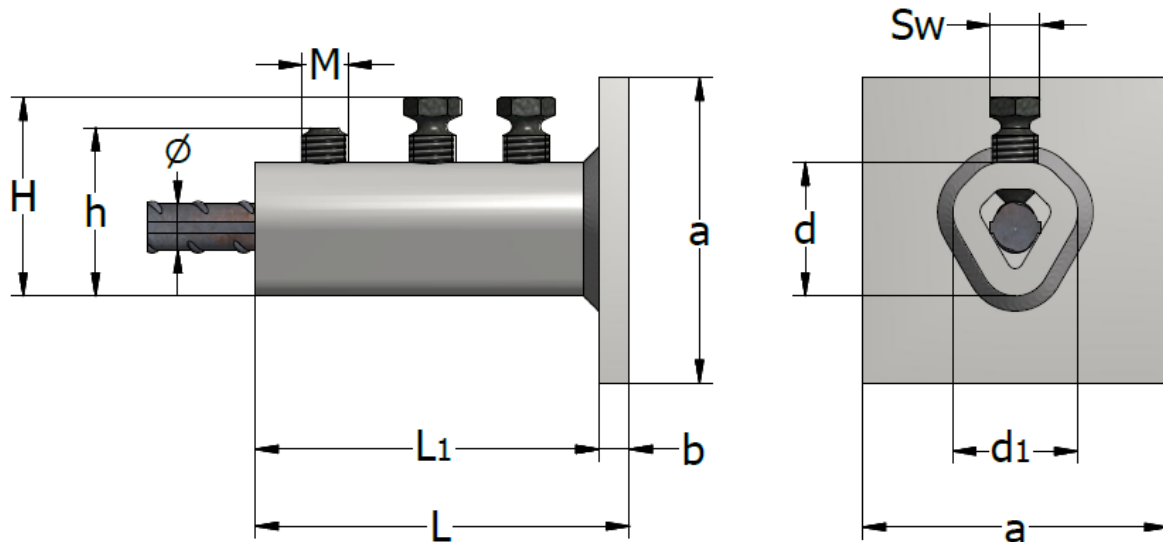


Then tighten the breaking bolts to shear them off.



ALLIGATOR END COUPLER – ALC-AP

The ALLIGATOR COUPLING WITH END ANCHORING is designed to ensure dead-end embedding of reinforcing steel bars in concrete. This helps to reduce the congestion and simplifies the placement of the reinforcing bars by eliminating the need for hooked ends. The ALLIGATOR END COUPLER includes half of an Alligator Coupling with a plate welded to one end, which will transfer the full tensile load of the bar when it bears against concrete. One advantage of this system is that there is no need for special preparation of the reinforcing bar.

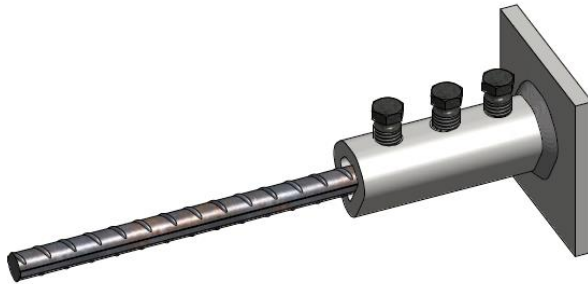


Type ALC-AP	Product no.	Rebar Ø [mm]	Breaking bolt number n	Breaking bolt thread M	L [mm]	a [mm]	b [mm]	d [mm]	d1 [mm]	H [mm]	h [mm]	SW [mm]	Torque moment [Nm]
10	43655	10	3	M12	88	80	8	35	33	Max. 48	38	13	100-115
12	43656	12	3	M12	98	80	8	35	33	Max. 51	41	13	100-115
14	43657	14	4	M12	123	100	8	37	36	Max. 56	46	13	100-115
16	43658	16	4	M12	123	100	8	40	36	Max. 58	48	13	100-115
18	43659	18	5	M12	150	100	10	44	42	Max. 59	49	13	100-115
20	43660	20	5	M16	140	100	10	47	44	Max. 66	54	17	195-215
22	43661	22	5	M16	175	100	10	53	50	Max. 70	58	17	195-215
25	43662	25	6	M16	205	100	10	56	52	Max. 73	61	17	195-215
26	63081	26	6	M20	225	150	15	66	62	Max. 86	71	22	355-405
28	43663	28	6	M20	225	150	15	66	62	Max. 88	73	22	355-405
30	63082	30	7	M20	255	150	15	73	68	Max. 90	75	22	355-405
32	43664	32	7	M20	255	150	15	73	68	Max. 95	80	22	355-405
36	43665	36	8	M20	285	150	15	79	73	Max. 101	86	22	355-405
40	43666	40	9	M20	305	150	15	79	73	Max. 104	89	22	355-405

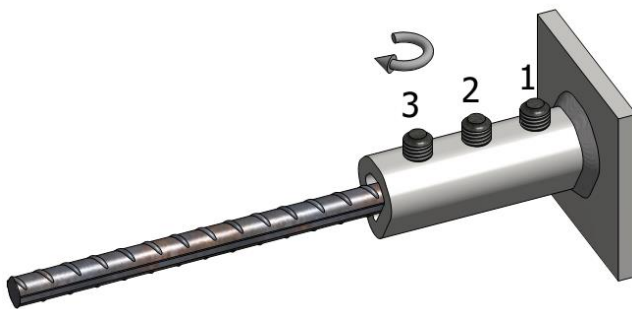


MOUNTING INSTRUCTIONS FOR ALC-AP COUPLER

- Mount the ALLIGATOR COUPLING to the reinforcement steel.



- Place the ALC-AP coupler over the end of rebar until the rebar reaches the surface of the plate.
- Tighten the breaking bolt by hand.
- Do not lubricate the bolt connection.
- Mount the bolts as straight as possible.



Tighten the breaking bolts completely using an electric or pneumatic wrench as on page 18-19. The bolts must be tightened from the centre outwards (1 to 3) until the heads of all the breaking bolts shear off.

Not removing/shearing off a bolt head during installation is acceptable provided the appropriate bolt torque is attained as detailed in the table on page 6. However, the installation is only considered satisfactory if the height H as in the table on page 6 is not exceeded. This must be measured to ensure satisfactory penetration and grip of the reinforcing bar.

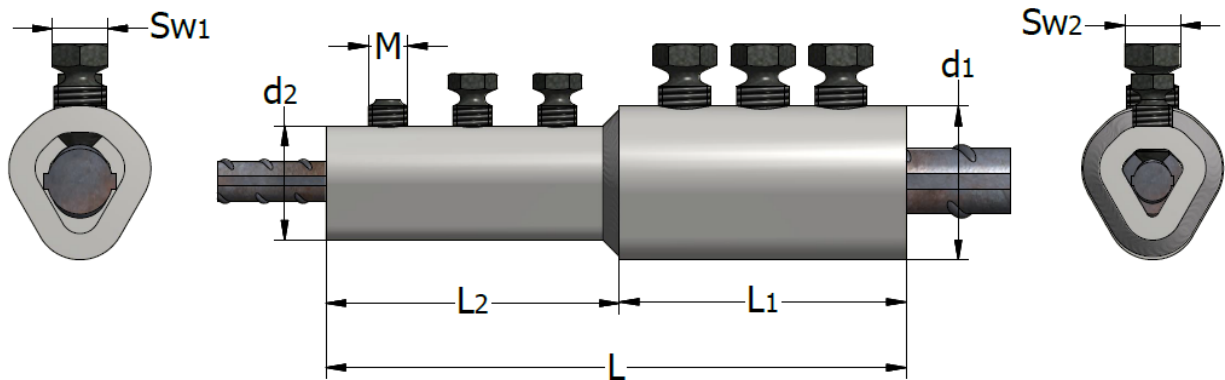
An example of using the ALC-AP – COUPLER is illustrated in the illustration below





TRANSITION COUPLER – ALC-VK

The ALLIGATOR TRANSITION COUPLER connects two different diameters of re-bar steel. This coupler can help the designer to optimize the structure in a safe, economical manner.



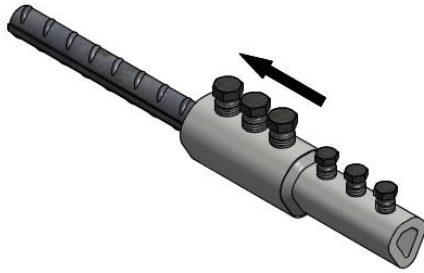
Type ALC-VK	Product no.	Rebar Ø [mm]	Breaking bolt number n	Breaking bolt thread M	L [mm]	L1 [mm]	L2 [mm]	d1 [mm]	d2 [mm]	SW1/SW2 [mm]	Max. Torque moment [Nm]
16/10-12	46210	16/10-12	4/3	M12/M12	205	115	90	40	35	13/13	115/115
20/12	44731	20/12	3/3	M16/M12	178	88	90	47	35	17/13	215/115
20/14	43593	20/14	4/4	M16/M12	227	112	115	47	37	17/13	215/115
20/16	44732	20/16	4/4	M16/M12	227	112	115	47	40	17/13	215/115
25/16	44733	25/16	3/4	M16/M12	221	106	115	56	40	17/13	215/115
25/20	44734	25/20	5/5	M16/M16	302	166	136	56	47	17/17	215/215
25/22	48255	25/22	5/5	M16/M16	331	166	165	56	53	17/17	215/215
28/25	48254	28/25	6/6	M20/M20	396	200	196	66	56	22/22	405/405
32/20	44735	32/20	4/5	M20/M16	282	140	136	73	47	22/17	405/215
32/25	44736	32/25	7/6	M20/M16	426	238	188	73	56	22/17	405/215
32/28	48253	32/28	7/6	M20/M20	446	238	208	73	66	22/22	405/405
36/32	61001	36/32	8/7	M20/M20	498	268	230	79	73	22/22	405/405
40/28	48252	40/28	7/6	M20/M20	430	230	200	79	66	22/22	405/405
40/32	44737	40/32	7/7	M20/M20	460	230	230	79	73	22/22	405/405

For the dimensions H (unruptured bolts), please see the table on page 6.



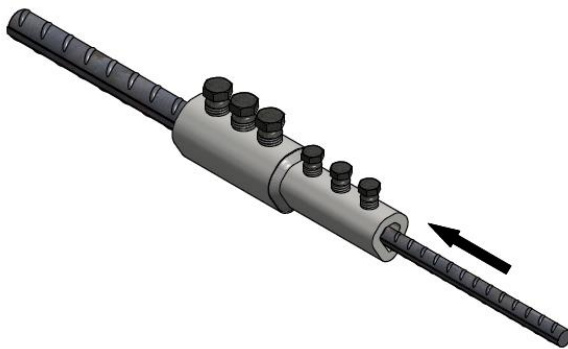
MOUNTING INSTRUCTIONS FOR ALC-VK COUPLER

- Mount the ALLIGATOR COUPLER to the reinforcement steel from one side.



-Place the ALC-VK coupler over the end of first rebar and tighten the breaking bolt by hand.

- Mount the second reinforcement bar in the ALLIGATOR COUPLER and tighten the breaking bolts until they shear off.



*-Insert the second rebar into the coupler until it reaches the first rebar.
-Do not lubricate the bolt connection.
-Tighten the breaking bolt by hand.*



Tighten the breaking bolts completely using an electric or pneumatic wrench as on page 18-19. The bolts must be tightened from the centre outwards (1 to 3) until the heads of all the breaking bolts shear off.

- The ALLIGATOR COUPLER in mounted state.



Completed ALC-VK coupler installation after all bolts have been sheared off.

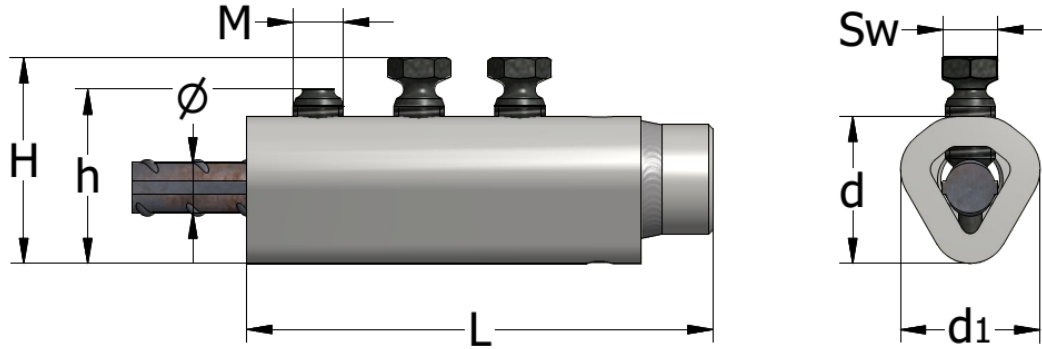
Not removing/shearing off a bolt during installation is acceptable provided the appropriate bolt torque is attained as detailed in the table on page 6. However, the installation is only considered satisfactory if the height H as in the table on page 6 is not exceeded. This must be measured to ensure satisfactory penetration and grip of the reinforcing bar.



CONTINUITY COUPLER – ALC-SK

The ALLIGATOR CONTINUITY COUPLER allows reinforcement to be extended at construction joints without the need to drill the formwork at the construction joint locations. The female part of the coupler is attached to the formwork with the aid of a threaded nailing plate. After removal of the formwork and the nailing plate, the male part of the coupler can be screwed into the installed part of the coupler. The ALC-SK coupler male component has one threaded bolt and two additional locknuts mounted on it, which are used to secure the connection. The male part of ALC-SK coupler can be replaced by a TSE coupler with the same size metric thread.

These couplers are also suitable for precast concrete element connections.

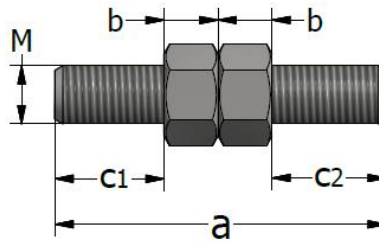


Type ALC-SK	Product no.	Rebar Ø [mm]	Breaking bolt number n	Breaking bolt thread M	L [mm]	d [mm]	d1 [mm]	H Unruptured Bolt [mm]	h [mm]	Bush thread	SW [mm]	Torque moment [Nm]
12	45745	12	3	M12	112	40	35	Max. 51	41	M16	13	100-115
16	45746	16	4	M12	156	47	35	Max. 68	48	M20	13	100-115
20	43578	20	5	M16	188	47	37	Max. 66	54	M24	17	195-215
25	45747	25	6	M16	255	47	40	Max. 73	61	M30	17	195-215
32	45748	32	7	M20	324	56	40	Max. 95	80	M42	22	355-405
40	45749	40	9	M20	386	56	47	Max. 104	89	M48	22	355-405



CONTINUITY COUPLER – PSK – MALE COMPONENT

The PSK Male coupler is used to connect two ALC-SK couplers. It consists of a threaded bar with two hexagonal nuts for blocking and securing the system.

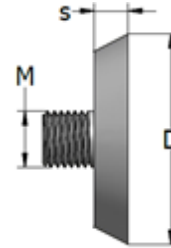
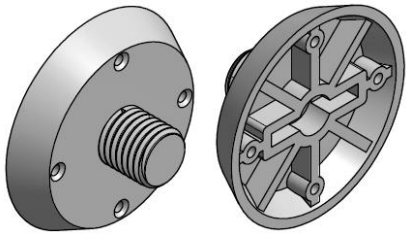


PSK	Product no.	Rebar Ø [mm]	Bolt thread	a [mm]	c1 [mm]	c2 [mm]	b [mm]
M16	63157	12	M16	80	24	30	13
M20	63158	16	M20	115	37	46	16
M24	63159	20	M24	140	47	55	19
M30	63160	25	M30	170	56	66	24
M42	63161	32	M42	250	84	98	34
M48	63162	40	M48	260	86	98	38



PLASTIC NAILING PLATE KU-10

The KU-10 nailing plates are used for affixing the ALC-SK coupler to the formwork with nails. The fixing flange ensures a minimal recess around the thread bush coupler. The recess is filled with fine concrete for protection against corrosion.



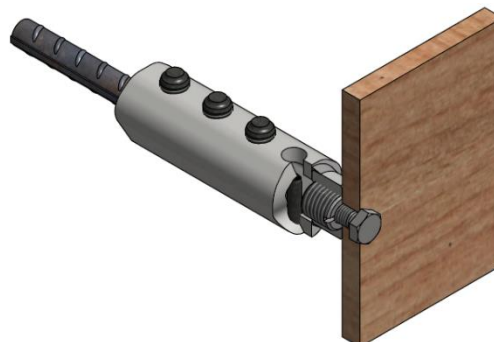
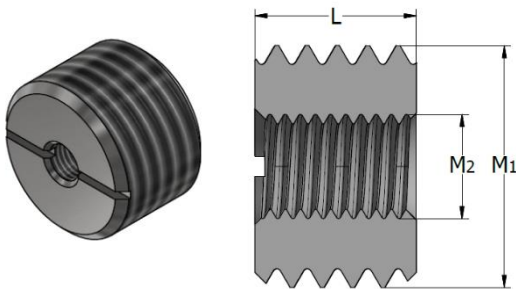
KU-10	Product no.	Thread	Diam. D	Diam. d	s	Colour
		M	[mm]	[mm]	[mm]	
KU-10-M12	63246	12	47	37	10	Red RAL 3020
KU-10-M16	63256	16	47	37	10	Grey RAL 7043
KU-10-M20	63257	20	60	50	10	Green RAL 6024
KU-10-M24	63258	24	60	50	10	Blue RAL 5015
KU-10-M30	63259	30	73	63	10	Violet blue RAL 5000
KU-10-M36	63260	36	73	63	10	Orange RAL 2009
KU-10-M42	63261	42	96	86	12	Brown RAL 8001
KU-10-M48	63131	48	96	86	12	White RAL 9003

Plastic nailing plates KU-10 are nailed to formwork. Using forming wax on the nailing plate makes it easier to remove and screw on anchor or fixing insert. The ALC-SK coupler must be fastened to the reinforcement by suitable means so that it does not move during concreting. After stripping, unscrew.

DOUBLE THREADED SCREW PLUG SN

SN thread screw plug is used to affix the ALC-SK to the formwork. The external thread fits inside the ALC-SK threaded bush and the inner diameter to secure the attachment to the formwork using a standard threaded bolt.

SN	Product no.	Thread	Thread	L
		M1	M2	[mm]
SN M12-M6	45214	12	6	16
SN M16-M8	45215	16	8	16
SN M20-M8	45216	20	8	16
SN M24-M8	46303	24	8	16
SN M24-M10	45217	24	10	16
SN M30-M10	45218	30	10	16
SN M30-M8	46079	30	8	16
SN M36-M10	45219	36	10	25
SN M42-M10	45220	42	10	30
SN M48-M10	45464	48	10	36
SN M48-M12	46525	48	12	36
SN M48-M16	46524	48	16	36



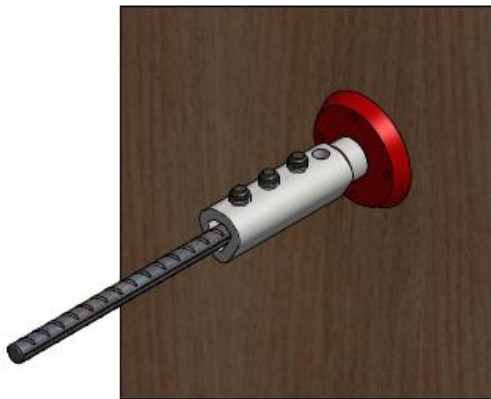


MOUNTING INSTRUCTIONS FOR ALC-SK COUPLER WITH TSE COUPLER

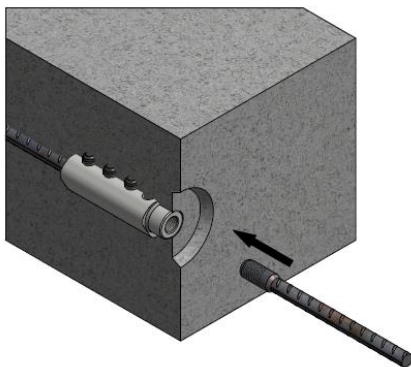


Tighten the breaking bolts completely using an electric or pneumatic wrench as on page 18-19. The bolts must be tightened from the centre outwards (1 to 3) until the heads of all the breaking bolts shear off.

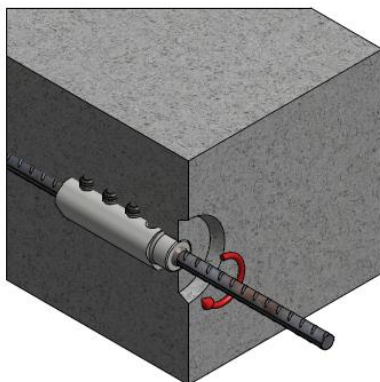
Not removing/shearing off a bolt head during installation is acceptable provided the appropriate bolt torque is attained as detailed in the table on page 6. However, the installation is only considered satisfactory if the height H as in the table on page 6 is not exceeded. This must be measured to ensure satisfactory penetration and grip of the reinforcing bar.



Attach the nail plate to the formwork and screw the ALC-SK completely onto the plate.



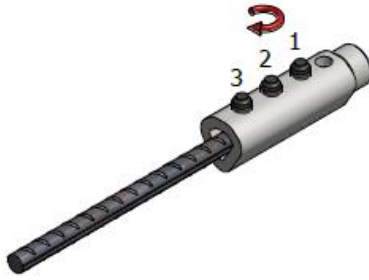
-Remove the formwork and unscrew the nailing plate.
-Screw the TSE coupler completely into the already fixed component.



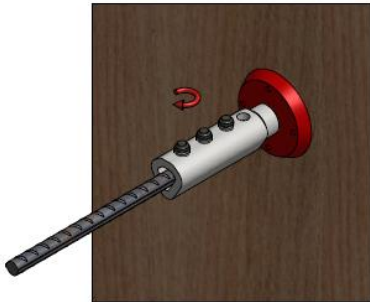
- Tighten the TSE coupler completely using a Terwa torque wrench.
The torque values are specified in the table on page 17.



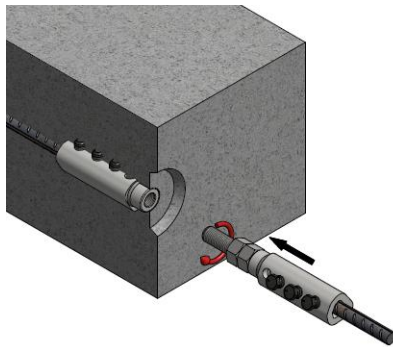
MOUNTING INSTRUCTIONS FOR ALC-SK COUPLER



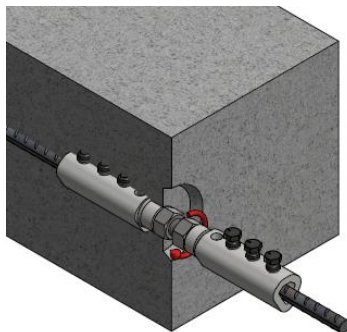
Tighten the breaking bolts completely using an electric or pneumatic wrench as on page 18-19. The bolts must be tightened from the centre outwards (1 to 3) until the heads of all the breaking bolts shear off.



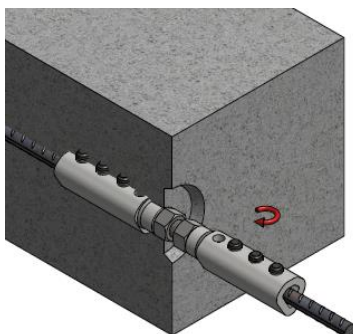
Attach the nail plate to the formwork and fully screw the ALC-SK onto the plate.



-Remove the formwork and unscrew the nailing plate.
-Screw the ALC-SK male component completely into the already attached component.
-Rotate the male component until the breaking bolts reach a position accessible for tightening.



-Run the first locknut along the threaded bolt until the attached ALC-SK component is reached.
-Tighten the locknut completely using a wrench.



Tighten the breaking bolts completely using an electric or pneumatic wrench as on page 18-19.



TERWA TORQUE WRENCH

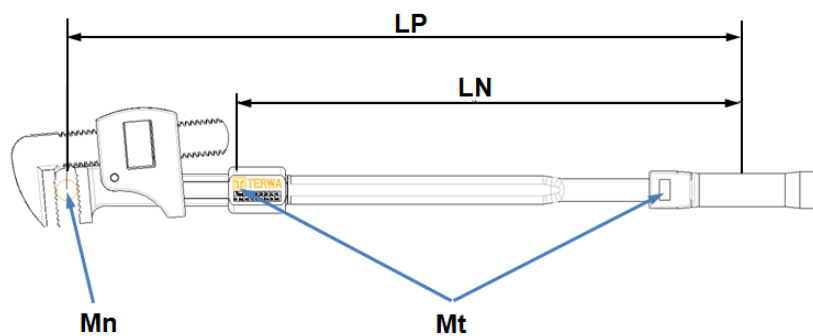
The Terwa Torque wrench is specially designed for correctly mounting the Terwa coupler on site and at the factories. All Terwa wrenches are delivered with a calibration report and work instructions.

The torque values for all rebar diameters are marked on the wrench. The torque values for all Terwa couplers are listed below.

Reinforcement diameter [mm]	Necessary Torque for each type of rebar [Nm]	Setting torque using wrench Mt [Nm]
10	50	60
12	60	60
14	70	60
16	80	60
18	90	70
20	100	75
22	110	82
25	125	93
28	140	104
32	160	119
40	200	148



TERWA torque wrench



Mn – required torque
Mt – setting torque using wrench
LP – length to middle of each reinforcement steel
LN – standard length wrench

$$Mt = Mn \times LN/LP$$

TERWA wrench dimensions

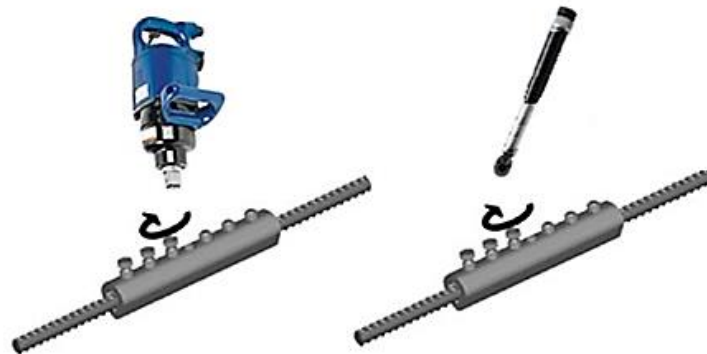


TOOLS FOR ALLIGATOR COUPLERS

- Use a high-speed, high-impact electric torque wrench or pneumatic wrench – we recommend minimum 1000 Nm.
- Try to prevent additional momentum during mounting/ shearing off the bolts.
- When using an air impact wrench, check the air pressure, torque rating and air flow requirements before starting the installation process.
- Removing/shearing off bolt heads is not required if appropriate bolt torque is attained. In this case please consult the table on page 6; the minimum height “H” has to be reached.
- When there is not enough space in the element to use a pneumatic or electric wrench, a hand-held torque wrench can be used to shear the bolt or to attain the torque momentum according to the table on page 6. The wrench momentum has to be a minimum of 2x the breaking bolt torque.
- Using hardened, heavy-duty sockets with a maximum external diameter is recommended; see the table below.

Type ALC	Breaking bolt Thread M	SW / [mm]	Maximum socket wrench diameter /[mm]
10	M12	13	Ø 26
12, 14-16, 18	M12	13	Ø 36
20	M16	17	Ø 27
22, 25	M16	17	Ø 39
28, 32, 36, 40	M20	22	Ø 33



The above-mentioned wrenches with the tooling necessary for shearing off bolts M12, M16 and M20 are available in boxes.



60627

ALC Electric Mounting Kit



60626

ALC Pneumatic Mounting Kit

Aluminium box	Product no.	Type wrench	Torque moment (NM)
1	60627	Electric	1000
2	60626	Pneumatic	1000-1898





ALL SPECIFICATIONS CAN BE CHANGED WITHOUT PREVIOUS NOTICE.

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