



# Ancon<sup>®</sup>

## MBT Mechanically- Bolted Couplers

for the Construction Industry

# Reinforcing Bar Couplers

## Simplify the design and construction of concrete

Lapped joints are not always an appropriate means of connecting reinforcing bars. The use of laps can be time consuming in terms of design and installation and can lead to greater congestion within the concrete because of the increased amount of rebar used.

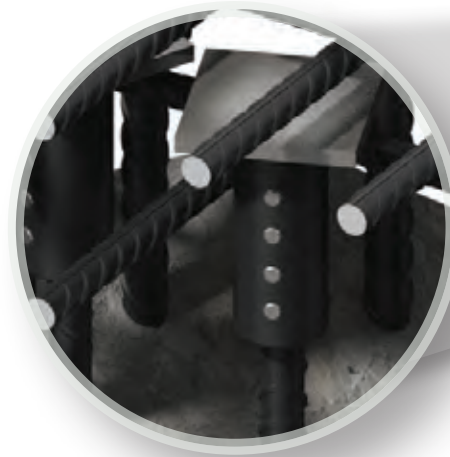
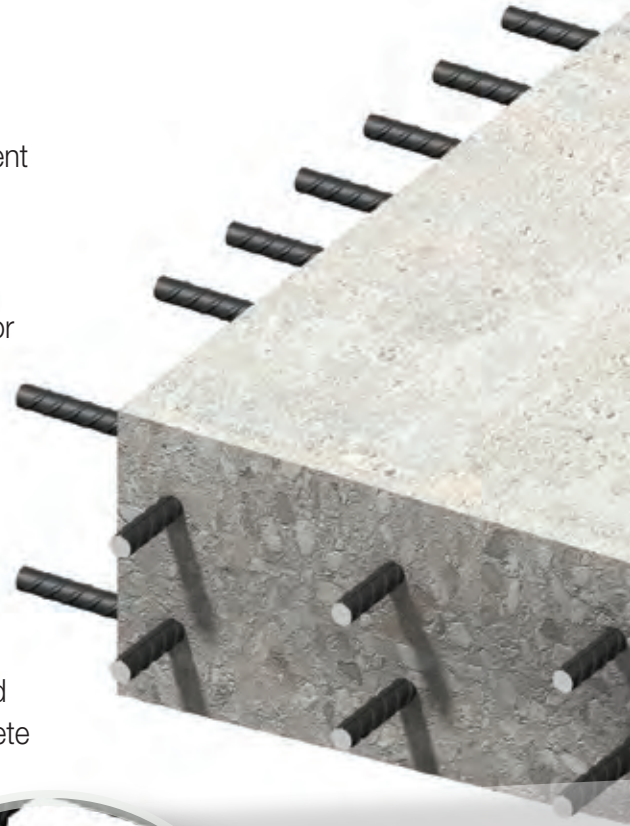
Ancon couplers can simplify the design and construction of reinforced concrete and reduce the amount of reinforcement required.

Lapped joints are dependent upon the concrete for load transfer. For this reason any degradation in the integrity of the concrete could significantly

affect the performance of the joint. The strength of a mechanical splice is independent of the concrete in which it is located and will retain its strength despite loss of cover as a result of impact damage or seismic event.

The Ancon range of reinforcing bar couplers is the most comprehensive available and includes tapered threaded, parallel threaded, mechanically bolted and grouted couplers.

Couplers for stainless steel and cryogenic-grade rebars complete the range.



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Eurocode 2 compliant



Simplify design and construction



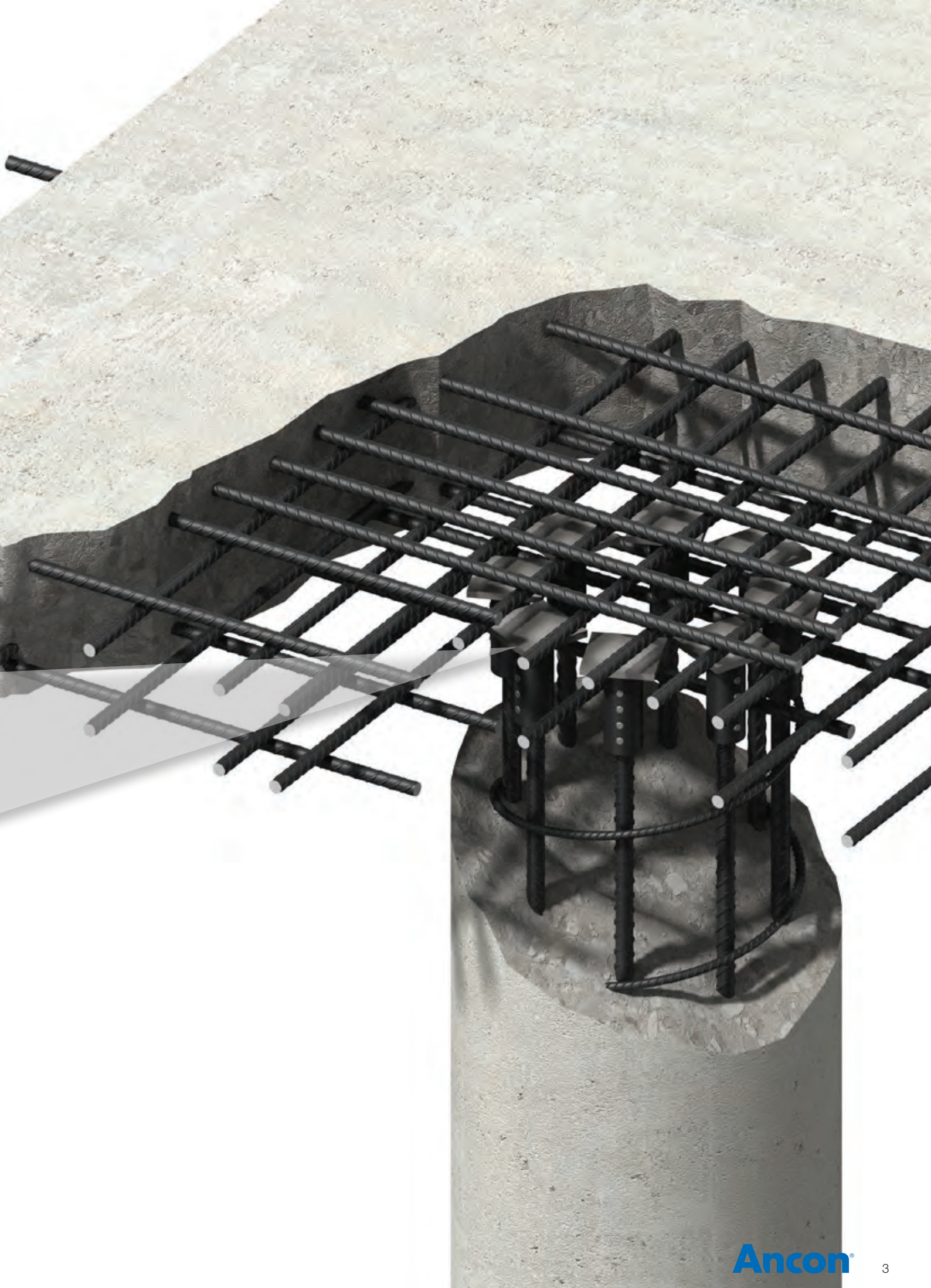
ISO 9001, ISO 14001, OHSAS 18001



Available through major rebar stockists and approved distributors



Dedicated sales support



# Reinforcing Bar Couplers

## MBT

The MBT range of couplers provides a cost-effective method of joining reinforcing bars, particularly when the fixed bar is already in place and there is insufficient space for a hydraulic swaging press.

MBT Couplers are easy to install and achieve failure loads higher than 115% of the characteristic yield strength of grade 500 reinforcing bar. Neither bar end preparation to form threads, nor bar rotation are required. MBT couplers can also be used to join imperial, plain round or deformed reinforcing bars.

The bar ends are supported within the coupler by two serrated saddles, and as the lockshear bolts are tightened, the conical ends embed themselves into the bar. As this happens the serrated saddles bite into both the bar and the shell of the coupler. The lockshear bolts of couplers up to and including the ET20 can be tightened using a ratchet wrench. For larger couplers a nut runner is recommended.

In all cases heavy duty sockets should be used. When the pre-determined tightening torque for the bolts is reached, the heads shear off leaving the top of the installed bolt slightly proud of the coupler. This provides an instant visual check of correct installation.

**Note:** Impact tools must not be used to tighten lockshear bolts.

## MBT ET Series

The MBT ET series of couplers is used to connect reinforcing bars of the same size.

## Testing & Approvals

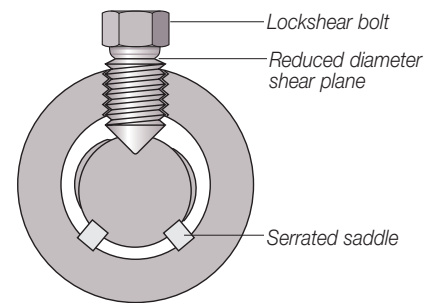
Full destructive tests are carried out on selected couplers from our stocks. MBT couplers are designed and manufactured in accordance with BS EN ISO 9001.

The most common sizes of ET series couplers are approved by HAPAS (Highway Authorities Product Approval) covered by certificate 15/H240 issued by the BBA, including the bar sizes featured in the table below. Sizes ET10, 12, 14, 16, 20, 25 and 28 have been tested and approved by the DIBt and are covered by Approval No Z-1.5-10. Further national approvals include BMVIT Approval No. -327.120/0018-II/ST2/2006, and SITAC Approval No.0541-95 which covers the ET Series and Continuity C Series. The full range of MBT Couplers is certified by GOST for the Russian Federation.

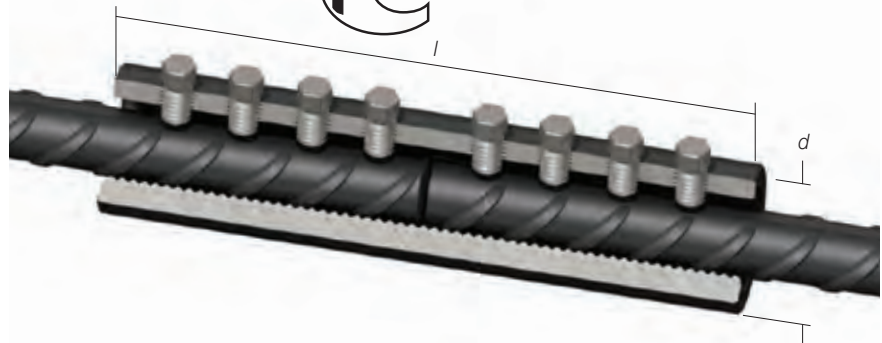


In addition the coupler has been tested to show compliance with the following international design codes:- BS EN 1992-1-1: 2004 (Eurocode 2), BS5400, BS8110, BS8597: 2015, ACI 318 and DIN 1045 German code.

**Note:** Not all coupler types and sizes are relevant to the national approvals shown. For details of coupler types and sizes relevant to each national approval please refer to the relevant approval document, which is available on request.



Section showing the embedment of the lockshear bolts and saddles into the bar and the shell of the coupler

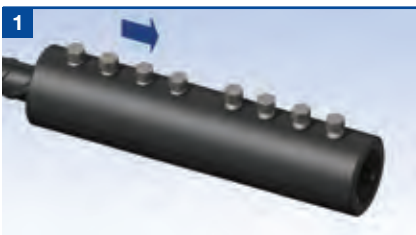


## MBT ET Series Dimensions

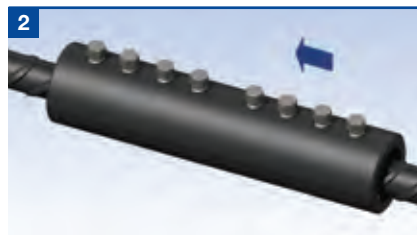
Bar Diameter (mm)		10	12	14	16	18	20	22	25	26	28	30	32	34	36	40
External Diameter (mm)	<i>d</i>	33.4	33.4	42.2	42.2	48.3	48.3	48.3	54.0	66.7	66.7	71.0	71.0	75.0	85.0	81.0
Total Length (mm)	<i>l</i>	100	140	160	160	204	204	248	258	312	312	312	312	420	484	484
Socket Size A/F (ins)		1/2	1/2	1/2	1/2	1/2	1/2	1/2	5/8	5/8	5/8	5/8	5/8	3/4	3/4	3/4
No. of Bolts		4	6	6	6	8	8	10	8	10	10	10	10	12	14	14
Approx Weight (kg)		0.52	0.72	1.25	1.25	2.0	1.96	2.38	3.00	5.91	5.80	6.68	6.50	8.85	15.30	11.30
Part No.		ET10	ET12	ET14	ET16	ET18	ET20	ET22	ET25	ET26	ET28	ET30	ET32	ET34	ET36	ET40

**Note:** Other sizes available on request. For details contact Ancon.

## Installation MBT ET Series



Place the coupler over the end of the bar to half the coupler length +/- 6mm and finger tighten the lockshear bolts onto the bar. Check the alignment and make any necessary adjustments.



Place the other bar end into the coupler until it pushes up against the first bar and finger tighten the remaining lockshear bolts. Check alignment and make any adjustments.



On one half of the coupler, starting from the centre and working outwards, partly tighten the lockshear bolts using either a ratchet wrench or a nut runner as appropriate. Do not use impact tools. Repeat again, this time fully tightening the lockshear bolts until the bolt heads shear off.

Repeat the above for the other half of the coupler.

## MBT Transition Series

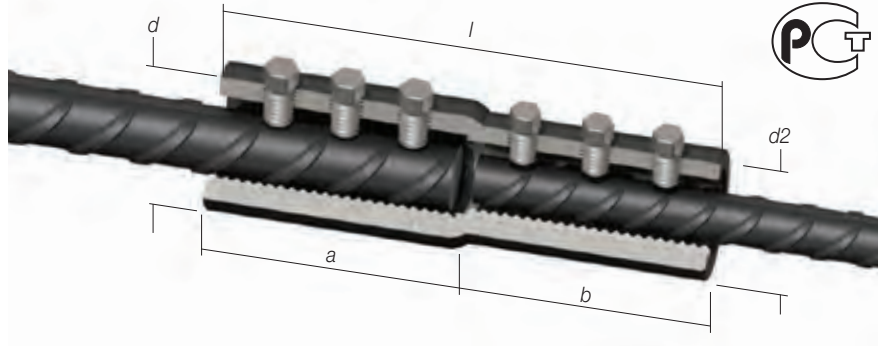
The MBT Transition series of couplers provides an effective solution for connecting bars of different diameters.

Transition couplers have all of the benefits of the ET series and are designed to achieve failure loads higher than 115% of the characteristic yield strength of the smaller grade 500 reinforcing bar.

They can be installed without any preparation to the bar ends and without any need to rotate bars.

The coupler can be rotated to allow access to the bolts for tightening with either a ratchet wrench or a nut runner. In all cases heavy duty sockets should be used. Transition couplers are non-standard and are made to order.

**Note:** Impact tools should not be used to tighten lockshear bolts.



### MBT Transition Series Dimensions

Bar Diameter (mm)		16/12	16/14	20/12	20/16	25/16	25/20	28/20	28/22	28/25	32/20	32/25	32/28	40/32
External Diameter (mm)	<i>d</i>	42.2	42.2	48.3	48.3	54.0	54.0	66.7	66.7	66.7	71.0	71.0	71.0	81.0
External Diameter (mm)	<i>d2</i>	26.4	42.2	33.4	48.3	42.2	54.0	48.3	41.7	54.0	48.3	54.0	66.7	71.0
Total Length (mm)	<i>l</i>	160	160	150	160	155	180	204	253	258	177	231	286	335
Individual Lengths	<i>a:b</i>	80:80	80:80	80:70	80:80	75:80	90:90	102:102	129:124	129:129	75:102	102:129	130:156	178:157
Socket Size A/F (ins)	<i>a:b</i>	1/2:1/2	1/2:1/2	1/2:1/2	1/2:1/2	5/8:1/2	5/8:1/2	5/8:1/2	5/8:1/2	5/8:5/8	5/8:1/2	5/8:5/8	5/8:5/8	3/4:5/8
No. of Bolts	<i>a:b</i>	3:3	3:3	3:3	3:3	2:3	3:3	3:4	4:5	4:4	2:4	3:4	4:5	5:5
Approx Weight (kg)		1.30	1.25	1.13	1.56	1.51	2.23	2.94	3.61	3.98	2.55	3.70	5.71	7.47
Part No.		ET16/12	ET16/14	ET20/12	ET20/16	ET25/16	ET25/20	ET28/20	ET28/22	ET28/25	ET32/20	ET32/25	ET32/28	ET40/32

### Installation

#### MBT Transition Series



Place the coupler over the end of the bar to the appropriate depth +/- 6mm and finger tighten the lockshear bolts onto the bar. Check the alignment and make any necessary adjustments.



Place the other bar end into the coupler until it pushes up against the first bar and finger tighten the remaining lockshear bolts. Check alignment and make any adjustments.



On one half of the coupler, starting from the centre and working outwards, partly tighten the lockshear bolts using either a ratchet wrench or a nut runner as appropriate. Do not use impact tools. Repeat again, this time fully tightening the lockshear bolts until the bolt heads shear off.

Repeat the above for the other half of the coupler.

#### Electric Wrench

Ancon Electric Wrenches are available for purchase or hire. The smooth continuous action of the wrench prevents the early shearing of the lockshear bolts and damage to threads. The wrench is supplied with specially hardened heavy duty sockets. For details please contact Ancon.



# Reinforcing Bar Couplers

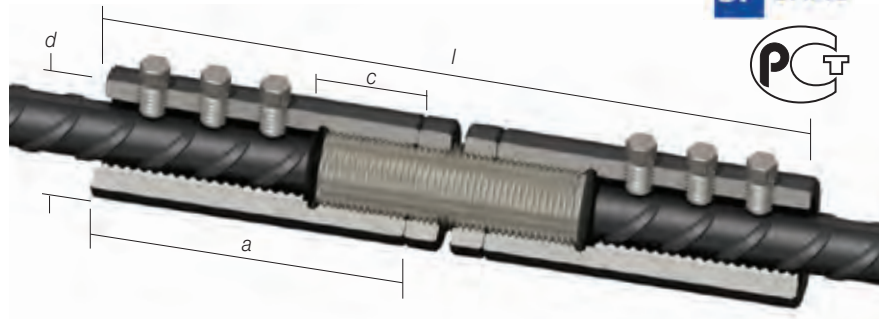
## MBT Continuity C Series

The MBT Continuity coupler allows reinforcement to be extended at construction joints without the need to drill or otherwise substantially deface the formwork.

The female part of the C series coupler is fixed to the formwork with the aid of a nail plate.

After removal of the formwork, the nail plate protects the internally threaded end of the coupler. It is advisable to loosen the nail plate to break the bond with the concrete whilst it is still 'green'. When the nail plate is removed, the male section can be screwed into the existing section of the coupler.

The 12mm and 16mm couplers have additional locknuts which are used to secure the connection. The two sections of sizes 20mm to 40mm couplers are locked together by an expanding cone in the male section.

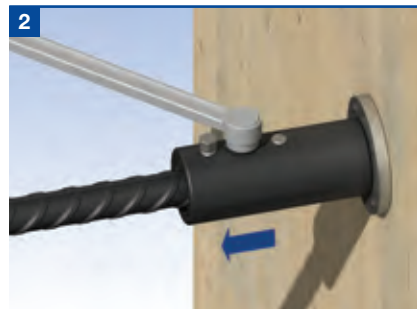


Bar Diameter (mm)		12	16	20	25	32	40
External Diameter (mm)	<i>d</i>	33.4	42.2	48.3	54.0	71.0	81.0
Maximum Length (mm)	<i>l</i>	250	280	349	414	490	675
Female Component Length (mm)	<i>a</i>	100	115	147	177	214	300
Threaded Section (mm)	<i>c</i>	30	35	38	43	53	53
Socket Size A/F (ins)		1/2	1/2	1/2	5/8	5/8	3/4
No. of Bolts		6	6	8	8	10	14
Nail Plate Diameter x Thickness		75 x 5	75 x 5	75 x 5	100 x 5	100 x 5	127 x 5
Approx Weight (kg)		1.40	2.20	3.70	5.15	11.5	18.8
Part No.		C12	C16	C20	C25	C32	C40

## Installation



Fix the nail plate to the formwork and fully screw the female component onto the plate. Insert the bar into the coupler, ensuring that it does not encroach into the threaded section. Finger tighten the lockshear bolts. Check alignment and make any adjustments.



Starting from the nail plate end and working outwards, partly tighten the lockshear bolts using either a ratchet wrench or a nut runner as appropriate. Do not use impact tools. Repeat again, this time fully tightening the lockshear bolts until the bolt heads shear off. Cast in concrete.



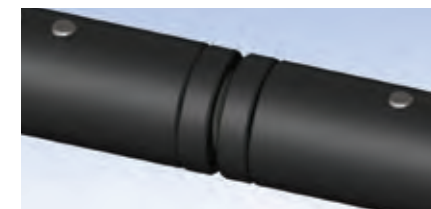
Remove the formwork and unscrew the nail plate. The male component can now be fully screwed into the fixed female component. The male component can be rotated up to a full turn to allow the bolts to be located in an accessible position for tightening.



Run the locknut along the threaded male stud to abut the female component. Fully tighten the locknut against the female section using a wrench.

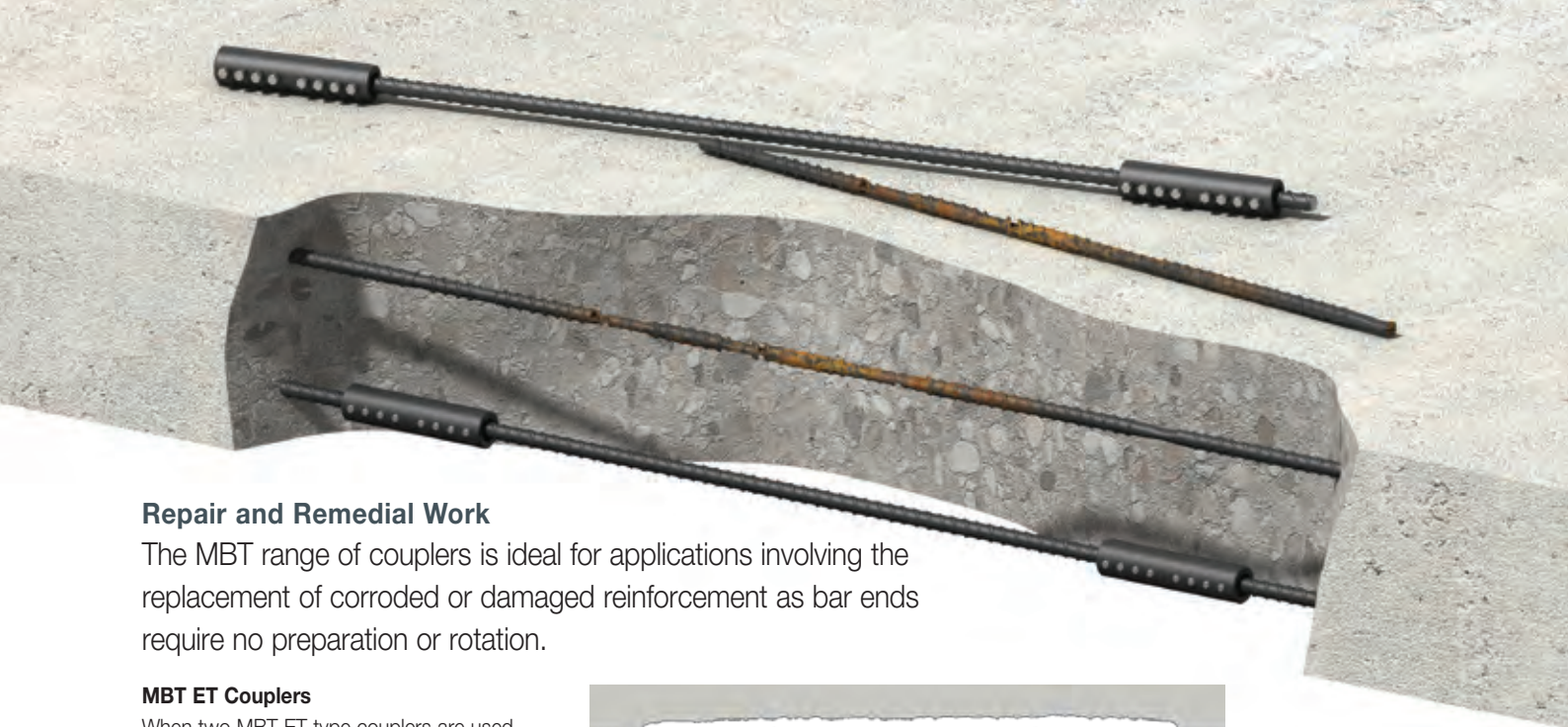


Place the continuation bar into the male component and finger tighten the bolts. Check alignment and make any adjustments. Starting from the centre and working outwards, partly tighten the lockshear bolts using either a ratchet wrench or a nut runner as appropriate. Do not use impact tools. Repeat again, this time fully tightening the lockshear bolts until the bolt heads shear off. Fully tighten the locknut.



**Note:** When the coupler is fully assembled the visible threaded stud between the two locknuts must not exceed 20mm.

**Note:** The Continuity Coupler male component will be delivered with the threaded stud already in place and the locknuts located on the threaded stud. If the female component is to be left in situ for an extended period, the threads must be greased to prevent corrosion.



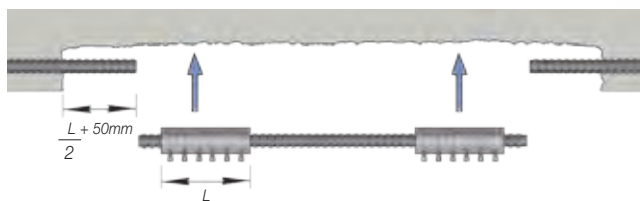
## Repair and Remedial Work

The MBT range of couplers is ideal for applications involving the replacement of corroded or damaged reinforcement as bar ends require no preparation or rotation.

### MBT ET Couplers

When two MBT ET type couplers are used, the replacement bar is cut approximately 5mm shorter than the original length to allow clearance for insertion between the sound ends of the in-situ bars. MBT ET couplers are pushed fully over both ends of the replacement bar and temporarily held in position. The replacement bar is then correctly positioned and the couplers moved to a previously marked position on the existing bars indicating half the length of the coupler. The lockshear bolts are tightened to complete the installation.

The above application is suitable where the bar being replaced is at least 2 x MBT ET coupler length (see page 22) + 100mm.



Bar replacement using two MBT ET Couplers



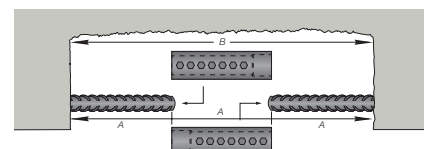
MBT Continuity C Series Gap Closer. Central threaded stud is modified to suit the gap.

### MBT Continuity C Series Gap Closer

A smaller section of bar can be removed and replaced by an MBT Continuity C Series coupler. The central threaded stud can be modified to suit the gap. The table provides the minimum bar length (dimension A) and minimum concrete pocket length (dimension B) to be cut away to facilitate this solution.

### MBT Continuity C Series Gap Closer

Bar Diameter (mm)	Minimum Dimensions	
	A	B
12	100	300
16	115	345
20	147	441
25	177	531
32	214	642
40	300	900



### Installation

#### Bar replacement using MBT Continuity C Series Gap Closer



1 Orientate so threaded sections face inwards and pass the two halves of the continuity coupler over the opposing bar ends to leave the gap visible.

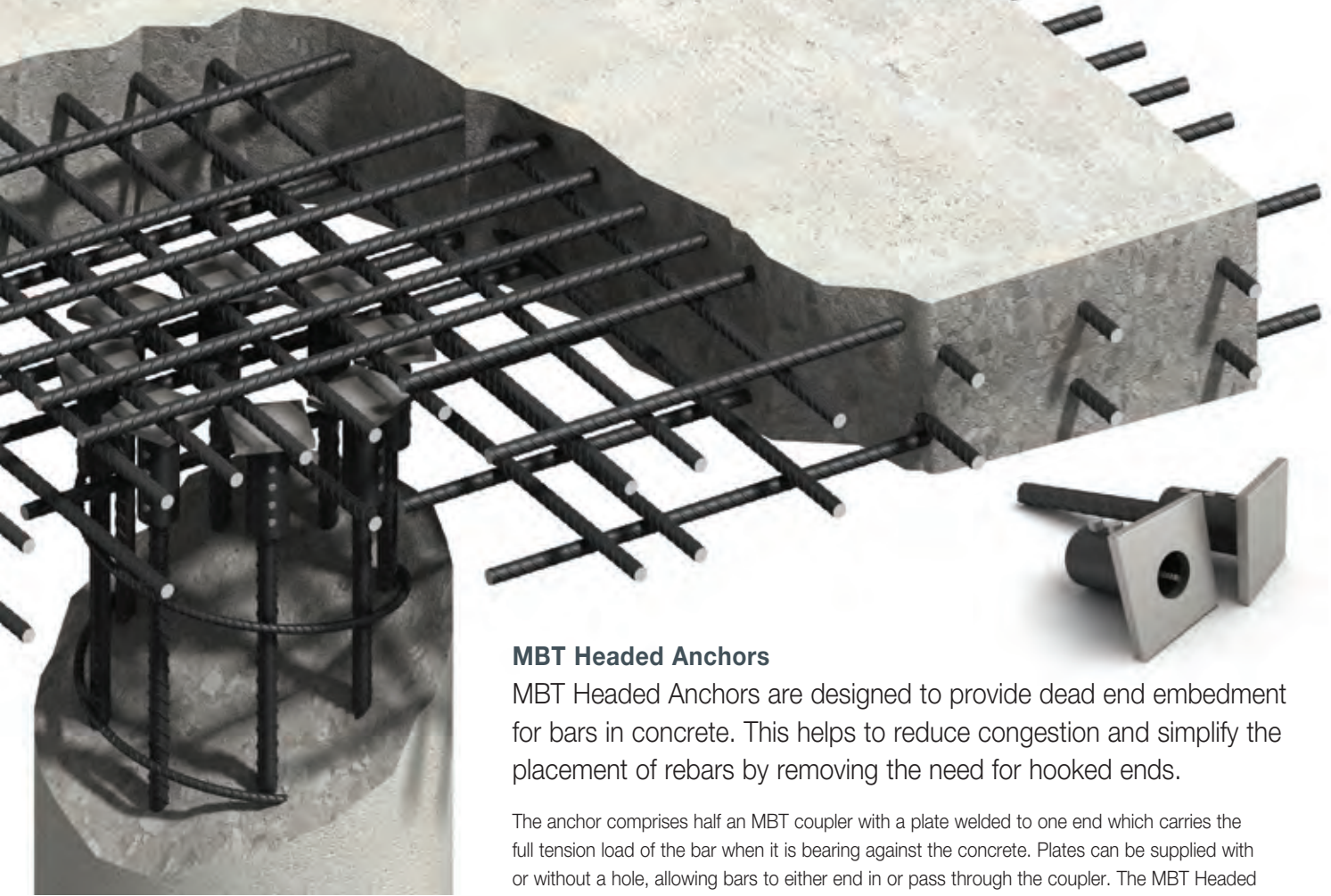


2 Insert appropriately sized stud in the gap and rotate each half of the coupler so the stud locates fully in each internal thread.



3 Tighten locknuts against the couplers. Shear bolt heads to complete installation by starting from the centre and working outwards and partly tightening the lockshear bolts using either a ratchet wrench or a nut runner as appropriate. Do not use impact tools. Repeat again, this time fully tightening the lockshear bolts.

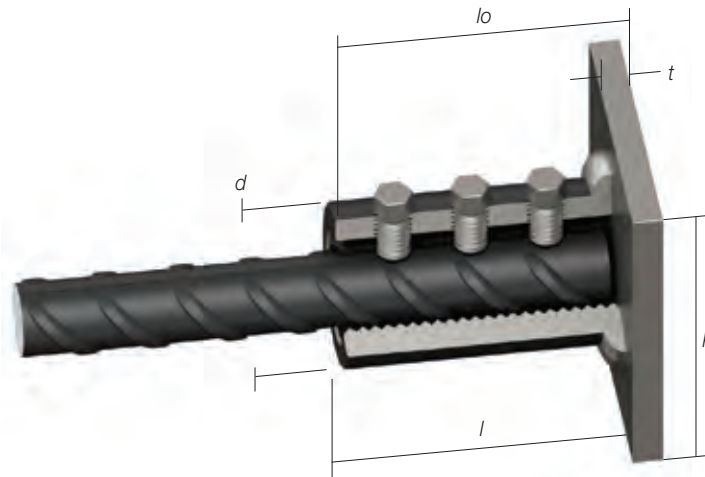
# Reinforcing Bar Couplers



## MBT Headed Anchors

MBT Headed Anchors are designed to provide dead end embedment for bars in concrete. This helps to reduce congestion and simplify the placement of rebars by removing the need for hooked ends.

The anchor comprises half an MBT coupler with a plate welded to one end which carries the full tension load of the bar when it is bearing against the concrete. Plates can be supplied with or without a hole, allowing bars to either end in or pass through the coupler. The MBT Headed Anchor also has the added advantage of requiring no special bar end preparation.



Bar Diameter (mm)	10	12	14	16	18	20	22	25	26	28	30	32	34	36	40
External Diameter (mm)	$d$ 33.4	33.4	42.2	42.2	48.3	48.3	48.3	54.0	66.7	66.7	71.0	71.0	75.0	85.0	81.0
Coupler Length (mm)	$l$ 55	75	82	82	104	104	126	129	156	156	156	156	215	247	247
Total Length (mm)	$l_o$ 65	85	92	92	114	114	136	139	168	168	171	171	230	262	262
Plate Thickness (mm)	$t$ 10	10	10	10	10	10	10	10	12	12	15	15	15	15	15
Plate w x h (mm)	$p$ 70	70	70	80	90	90	90	100	110	110	130	130	130	150	150
Socket Size A/F (ins)	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
No of Bolts	2	3	3	3	4	4	5	4	5	5	5	5	6	7	7
Approx Weight (kg)	0.64	0.74	1.01	1.07	1.58	1.58	1.72	2.29	3.81	4.14	5.08	4.72	5.17	9.13	8.30
Part No. (No hole in plate)	ETHA10	ETHA12	ETHA14	ETHA16	ETHA18	ETHA20	ETHA22	ETHA25	ETHA26	ETHA28	ETHA30	ETHA32	ETHA34	ETHA36	ETHA40
Part No. (Hole in plate)	ETHA10H	ETHA12H	ETHA14H	ETHA16H	ETHA18H	ETHA20H	ETHA22H	ETHA25H	ETHA26H	ETHA28H	ETHA30H	ETHA32H	ETHA34H	ETHA36H	ETHA40H

Note: Minimum compressive strength of concrete 25N/mm<sup>2</sup>.





## HM Grout Sleeve Couplers

Ancon HM Grout Sleeves have been designed to cater for the rebar tolerance/bar alignment issues associated with joining precast concrete elements together.

The range comprises two standard coupler types: Full-grout sleeves and Half-grout sleeves. In the first, bars are simply inserted to meet at the nominal centre point of the sleeve. In the latter, one end features a threaded insert to accept a pre-threaded bar while the other end is open to accommodate a non-threaded continuation bar. The standard insert suits Ancon Bartec Plus parallel-threaded rebars. Other inserts are available.



HM Full-grout Coupler



HM Half-grout Coupler

These couplers are machined from seamless high strength steel tube and used with Ancon's high performance, shrinkage-compensated, cementitious grout.

Tests show compliance with the rebar coupler performance specifications in BS 8597 and ISO 15835.

Contact Ancon for full technical details or download the product brochure online.

## Other Ancon Products

### Reinforcement Continuity Systems

Reinforcement Continuity Systems are an increasingly popular means of maintaining continuity of reinforcement at construction joints in concrete. The Ancon Eazistrip re-bend system is approved by UK CARES and consists of pre-bent bars housed within a galvanised steel casing. Once installed, the bars are straightened ready for lapping with slab reinforcement. Ancon KSN Anchors and Ancon Starter Bars are cast into a concrete wall and accept threaded continuation bars. They easily accommodate long EC2 lap lengths and eliminate the need for on-site bar straightening. KSN Anchors minimise rebar congestion in the wall.



### Shear Load Connectors

Ancon DSD and ESD Shear Load Connectors are used to transfer shear across expansion and contraction joints in concrete. They are more effective at transferring load and allowing movement to take place than standard dowels. The range features rectangular box section sleeves to allow lateral movement in addition to longitudinal movement. A range of Lockable Dowels is available for temporary movement joints in post-tensioned concrete.



### Channel and Bolt Fixings

Ancon offers a wide range of channels and bolts in order to fix stainless steel masonry support, restraints and windposts to structural frames. Cast-in channels and expansion bolts are used for fixing to the edges of concrete floors and beams.



### Punching Shear Reinforcement

Ancon Shearfix is used within a slab to provide additional reinforcement from punching shear around columns. The system is approved by UK CARES and consists of double-headed steel studs welded to flat rails. Shearfix is designed to suit the load conditions and slab depth at each column using free calculation software from Ancon.



### Insulated Balcony Connections

Ancon's thermally insulated connectors minimise heat loss at balcony locations while maintaining structural integrity. They provide a thermal break and, as a critical structural component, transfer moment, shear, tension and compression forces. Standard solutions are available for concrete-to-concrete, steel-to-concrete and steel-to-steel interfaces.



Masonry Support Systems  
 Lintels  
 Masonry Reinforcement  
 Windposts and Parapet Posts  
 Wall Ties and Restraint Fixings  
 Channel and Bolt Fixings  
 Tension and Compression Systems  
 Insulated Balcony Connectors  
 Shear Load Connectors  
 Punching Shear Reinforcement  
**Reinforcing Bar Couplers**  
 Reinforcement Continuity Systems  
 Stainless Steel Fabrications  
 Flooring and Formed Sections  
 Refractory Fixings



# Ancon®

**Ancon Ltd**  
 President Way, President Park  
 Sheffield S4 7UR  
 United Kingdom  
 Tel: +44 (0) 114 275 5224  
 Fax: +44 (0) 114 276 8543  
 Email: [info@ancon.co.uk](mailto:info@ancon.co.uk)  
 Visit: [www.ancon.co.uk](http://www.ancon.co.uk)  
 Follow on Twitter: @AnconUK

**Ancon Building Products**  
 98 Kurrajong Avenue  
 Mount Druitt  
 Sydney NSW 2770  
 Australia  
 Tel: +61 (0) 2 8808 3100  
 Fax: +61 (0) 2 9675 3390  
 Email: [info@ancon.com.au](mailto:info@ancon.com.au)  
 Visit: [www.ancon.com.au](http://www.ancon.com.au)

**Ancon (Schweiz) AG**  
 Grenzstrasse 24  
 3250 Lyss  
 Switzerland  
 Tel: +41 (0) 31 750 3030  
 Fax: +41 (0) 31 750 3033  
 Email: [info@ancon.ch](mailto:info@ancon.ch)  
 Visit: [www.ancon.ch](http://www.ancon.ch)

**Ancon GmbH**  
 Bartholomäusstrasse 26  
 90489 Nuremberg  
 Germany  
 Tel: +49 (0) 911 955 1234 0  
 Fax: +49 (0) 911 955 1234 9  
 Email: [info@anconbp.de](mailto:info@anconbp.de)  
 Visit: [www.anconbp.de](http://www.anconbp.de)

**Ancon (Middle East) FZE**  
 PO Box 17225  
 Jebel Ali  
 Dubai  
 United Arab Emirates  
 Tel: +971 (0) 4 883 4346  
 Fax: +971 (0) 4 883 4347  
 Email: [info@ancon.ae](mailto:info@ancon.ae)  
 Visit: [www.ancon.ae](http://www.ancon.ae)

**Ancon Building Products**  
 2/19 Nuttall Drive  
 Hillsborough  
 Christchurch 8022  
 New Zealand  
 Tel: +64 (0) 3 376 5205  
 Fax: +64 (0) 3 376 5206  
 Email: [info@ancon.co.nz](mailto:info@ancon.co.nz)  
 Visit: [www.ancon.co.nz](http://www.ancon.co.nz)

**Ancon Building Products GesmbH**  
 Puchgasse 1  
 A-1220 Vienna  
 Austria  
 Tel: +43 (0) 1 259 58 62-0  
 Fax: +43 (0) 1 259 58 62-40  
 Email: [info@ancon.at](mailto:info@ancon.at)  
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These products are available from:

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The construction applications and details provided in this literature are indicative only. In every case, project working details should be entrusted to appropriately qualified and experienced persons.

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With a policy of continuous product development Ancon reserves the right to modify product design and specification without due notice.

