Tapered Thread Couplers
for the Construction Industry
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 couplers and grouted couplers.

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

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Reinforcing Bar Couplers

Tapered Thread
The Ancon range of Tapered Thread couplers is designed to suit the majority of applications which call for the joining of reinforcing bars. Available to suit bar sizes 12mm to 50mm, the couplers are installed quickly and easily on site without the need for specially trained personnel or specialised, expensive machinery.

The compact design of each coupler ensures suitability for use in confined situations where space is restricted or where the loss of cover must be minimised. The couplers are normally supplied fitted to the end of threaded bar, requiring only the engagement and tightening of the adjoining bar on site. In order to ensure correct installation, Ancon specifies the use of a torque wrench. The range of Tapered Thread couplers is available through major rebar suppliers. Please contact Ancon for further details.

Standard Coupler
The Standard Tapered Thread coupler is suitable for connecting two bars of the same diameter, where one bar can be rotated. It comprises an internally threaded sleeve with two right hand threads which are tapered towards the middle of the coupler. The bar ends are square cut and a tapered thread is cut onto the bar. A nominal allowance of +25mm should be allowed per threaded bar end for square cutting the bar end.

The couplers are generally torqued onto the reinforcing bar in the bar threading shop, the internal threads protected by plastic end caps. The threaded ends of the continuation bar are protected by plastic thread protectors.

Engagement of the bar within the coupler is simplified by the tapered thread design which aids alignment. When the bar is fully engaged within the coupler, the continuation bar is tightened using a torque wrench.

The Ancon Standard Tapered Thread coupler is compliant with BS 8597: 2015 Steels for the Reinforcement of Concrete. Reinforcement Couplers. Requirements and Test Methods. They are designed to achieve failure loads in excess of 115% of the characteristic strength of grade 500 rebar.

Standard Coupler Dimensions

<table>
<thead>
<tr>
<th>Bar Diameter (mm)</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
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<td>60</td>
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<td>Coupler Length (mm)</td>
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Testing and Approvals
The Standard range of Tapered Thread couplers has been independently tested to demonstrate compliance with the following codes:

- UK CARES TA1-B Approval No 5015 - BS EN 1992-1-1: 2004 (Eurocode 2) and BS 8110
- DIBt Approval No. Z-1.5-179 - Sections 12.6 and 12.8 of DIN 1045-1:2008-08 and Sections 8.4 and 8.7 of DIN EN 1992-1-1:NA.
- ÜA Approval No. R-2.1.9-17-15658
- SITAC Approval No. 0425/02
- ITB Approval No. AT-15-9037/2013

Note: Not all coupler types, sizes and torque values 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.
Installation
Tapered Thread Standard Series

1. The coupler is normally supplied fixed to the reinforcing bar, ready to be installed and cast in concrete.

2. After casting the concrete and when ready to extend, remove the plastic end cap from the coupler. Position the continuation bar in the sleeve and rotate the bar into the coupler.

3. Continue to screw the bar into the coupler until tight.

4. To ensure correct installation, tighten the joint to the specified torque using a calibrated torque wrench on the continuation bar. Tightening torques are shown in the table opposite.
Positional Coupler
The Ancon Tapered Thread Positional coupler is designed to be used in applications in which neither bar can be rotated. Having a degree of adjustability, the Positional coupler can also be used as a closer between two fixed bars.

The Positional coupler comprises three components, a male section, a female section and a locking nut. The male component has an internal tapered thread and an extended external parallel thread. The female component has a parallel thread and a tapered thread, both of which are internal. A locknut is used to secure the connection when the correct degree of adjustability has been achieved. All components, including the locknut must be tightened using a torque wrench. Plastic thread protectors are used to prevent damage to the threaded bar ends and the internal threads of the couplers are protected by plastic end caps. A nominal allowance of +25mm should be allowed per threaded bar end for square cutting the bar end.

Testing & Approvals
The Positional range of Tapered Thread couplers has been independently tested to demonstrate compliance with the following codes:
- UK CARES TA1-B Approval No 5015 - BS EN 1992-1-1: 2004 (Eurocode 2), BS 8110 and BS 8597: 2015
- DIBt Approval No. Z-1.5-179 - Sections 12.6 and 12.8 of DIN 1045-1:2008-08 and Sections 8.4 and 8.7 of DIN EN 1992-1-1/NA.
- ÜA Approval No. R-2.1.9-17-15658
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Note: Not all coupler types, sizes and torque values 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.

Positional Coupler Dimensions

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<tr>
<th>Bar Diameter (mm)</th>
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<td>70</td>
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<td>85</td>
<td>190</td>
<td>231</td>
<td>359</td>
<td>454</td>
</tr>
</tbody>
</table>

Bar Insertion Prior to Engagement
- 9 12 15 18 21 25 28 31 34 40 54

Bar Insertion Full Engagement
- 26 29 32 33 37 42 44 47 50 53 56 58 66 82

Adjustable Length
- 23 24 25 26 28 34 34 36 37 42 54 67

Max Distance between Bar Ends
- 126 124 132 131 131 165 166 171 182 185 174 195 199 216 227 242 290

Weight (kg)
- 0.44 0.67 0.87 0.95 1.12 1.56 2.21 2.21 2.30 3.34 3.51 4.66 5.58 6.91 11.96

Coilper Torque (Nm)
- 80 85 110 135 165 205 265 270 275 280 285 296 305 330 350

Locknut Torque (Nm)
- 20 25 30 40 50 60 70 80 80 85 90 100 105 110 130

Part No.
- TTP12 TTP14 TTP16 TTP18 TTP20 TTP22 TTP25 TTP28 TTP30 TTP32 TTP34 TTP36 TTP40 TTP50
Run the locknut along the threaded barrel of the male component to abut the female section. Using the torque wrench, tighten the locknut to the specified torque. Tightening torques are shown in the table opposite.

At this point the groove in the parallel threaded section of the male component must be completely covered by the locknut. If any part of the groove is visible beyond the locknut, the degree of adjustability has been exceeded and the installation is incorrect.

**Correct Installation**

Groove is completely hidden within locknut

**Incorrect Installation**

Groove is protruding from locknut
Reinforcing Bar Couplers

**Transition Coupler**

The Ancon Tapered Thread Transition coupler is used to join reinforcing bars of different diameters where one coupler can be rotated.

With all the benefits of the Standard range, Transition couplers are designed to achieve failure loads greater than the national code requirement of the smaller diameter grade 500 reinforcing bar. The Transition coupler comprises an internally threaded sleeve with two right hand threads both of which are tapered towards the middle of the coupler. The diameter of each thread corresponds to the appropriate bar size. A nominal +25mm should be allowed per threaded bar end for square cutting the bar end.

**Testing & Approvals**

The Transition range of Tapered Thread couplers has been independently tested to demonstrate compliance with the following codes:

UK CARES TA1-B Approval No 5015 - BS EN 1992-1-1: 2004 (Eurocode 2) and BS 8110

DIBt Approval No. Z-1.5-179 - Sections 12.6 and 12.8 of DIN 1045-1:2008-08 and Sections 8.4 and 8.7 of DIN EN 1992-1-1/NA.

ÚA Approval No. R-2.1.9-17-15658

SITAC Approval No. 0425/02

**Note:** Not all coupler types, sizes and torque values 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.

**Transition Coupler Dimensions**

<table>
<thead>
<tr>
<th>Bar Diameter (mm)</th>
<th>12/14</th>
<th>12/16</th>
<th>14/16</th>
<th>16/18</th>
<th>18/20</th>
<th>20/22</th>
<th>22/24</th>
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<th>34/36</th>
<th>36/38</th>
<th>38/40</th>
<th>40/42</th>
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<td>22</td>
<td>25</td>
<td>25</td>
<td>28</td>
<td>30</td>
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<td>42</td>
<td>48</td>
<td>45</td>
<td>55</td>
<td>55</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>Coupler Length (mm)</td>
<td>65</td>
<td>72</td>
<td>71</td>
<td>75</td>
<td>78</td>
<td>77</td>
<td>82</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>99</td>
<td>112</td>
<td>114</td>
<td>110</td>
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<td>138</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.14</td>
<td>0.21</td>
<td>0.19</td>
<td>0.25</td>
<td>0.30</td>
<td>0.28</td>
<td>0.32</td>
<td>0.48</td>
<td>0.65</td>
<td>0.62</td>
<td>0.72</td>
<td>1.11</td>
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<td>TTT38/40</td>
<td>TTT40/42</td>
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</table>

**Installation**

**Tapered Thread Transition Series**

The coupler is normally supplied fixed to a reinforcing bar, ready to be installed and cast in concrete.

After casting the concrete and when ready to extend, remove the plastic end cap from the coupler. Position the continuation bar in the sleeve and rotate the bar into the coupler.

Continue to screw the bar into the coupler until tight.

To ensure correct installation, tighten the joint to the specified torque using a calibrated torque wrench on the continuation bar. Tightening torques are shown in the table below.

**Note:** In the event of the coupler being supplied fixed to the smaller bar it is necessary to ensure that when tightening the larger continuation bar, the force is not transmitted through the smaller bar.
Tapered Thread Weldable Couplers

Ancon Tapered Thread Weldable couplers provide a convenient means of connecting reinforcing bars to structural steel plates or sections.

Shorter than the standard coupler, it has a tapered thread at one end. The other end is welded directly to the steel. The couplers are manufactured from either steel grade 1045 to ASTM A576 or steel grade C45R to EN10083.

The Tapered Thread Weldable coupler is suitable for welding to structural steels, Grade S275 or Grade S355. The load conditions at the connection must be determined by the designer along with the type and size of weld required. Another important consideration is the type of electrode to be used, which must be matched to the properties of the plate and tube, and to the site conditions under which the welding will be undertaken. Welders should be qualified for the type of weld required. As a minimum standard, welding of the couplers shall be in accordance with the guidance provided in the following documents:

- BS EN 287-1 Qualification test of welders, Fusion welding, Steels
- BS EN 9606-1:2013 Qualification testing of welders, Fusion welding, Steels
- BS EN 1011-1:2009 Welding.

Carbon Equivalent Value - The Carbon Equivalent value of these couplers may typically vary between 0.50 – 0.75, where the carbon equivalent value is given by:

$$CEV = C + \frac{Mn}{6} + \frac{Ni+Cu}{15} + \frac{Cr+Mo+V}{5}$$

For further assistance and technical information please contact Ancon.

Testing & Approvals

The Welded range of Tapered Thread couplers has been independently tested to demonstrate compliance with the following codes:

- DIBt Approval No. Z-1.5-179 - Sections 12.6 and 12.8 of DIN 1045-1:2008-08 and Sections 8.4 and 8.7 of DIN EN 1992-1-1/NA.
- ÜA Approval No. R-2.1.9-17-15658
- ITB Approval No. AT-15-9037:2013

Notes: Not all coupler types, sizes and torque values 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.

Installation

1. The coupler must first be welded to the steelwork.
2. When ready to extend, remove the plastic end cap and position the continuation bar into the sleeve.
3. Rotate the bar into the coupler until tight.
4. To ensure correct installation, tighten the joint to the specified torque using a calibrated torque wrench on the continuation bar. Tightening torques are shown in the table below.

Weldable Coupler Dimensions

<table>
<thead>
<tr>
<th>Bar Diameter (mm)</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>25</th>
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<tbody>
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<td>55</td>
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<td>Coupler Length (mm) l</td>
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<td>0.72</td>
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<td>0.97</td>
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<tr>
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<td>TTW40</td>
<td>TTW50</td>
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</tbody>
</table>
Reinforcing Bar Couplers

Tapered Thread Headed Anchors
The Tapered Thread Headed Anchor provides an alternative method of achieving rebar end anchorage within concrete.

Anchorage of rebars within a concrete section is traditionally achieved by means of creating a long hooked end on the rebar. This can lead to problems when positioning the bar and can increase congestion. It can ultimately result in larger than necessary concrete sections at the location of the hooked ends.

Consisting of an oversized coupler, the Tapered Thread Headed Anchor carries the full tension load of the bar when it is bearing against the concrete. The Headed Anchor removes the need for hooked rebar and subsequently reduces congestion and simplifies bar placement. This in turn increases speed of construction and gives greater flexibility in design. Typical applications include pile caps and beam to column connections.

Tapered Thread Headed Anchor Dimensions

<table>
<thead>
<tr>
<th>Bar Diameter (mm)</th>
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<th>16</th>
<th>18</th>
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<tbody>
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<td>205</td>
<td>250</td>
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<td>275</td>
<td>280</td>
<td>285</td>
<td>295</td>
<td>305</td>
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</table>

Part No. | TTH12 | TTH14 | TTH16 | TTH18 | TTH20 | TTH22 | TTH24 | TTH25 | TTH26 | TTH28 | TTH30 | TTH32 | TTH34 | TTH36 | TTH40 |

Note: Where tapered thread headed anchors are used, the compressive strength of the concrete shall not be less than strength grade C32/40 (cylinder/cube).

Tapered Thread Parallel Thread Adaptors
The TTA Tapered Thread Parallel Thread Adaptor accepts a standard metric bolt or studding.

It is particularly useful for connecting temporary fixtures to concrete. Once the fixture is removed, reinforcement continuity can be achieved in the second phase construction by using another TTA adaptor and central threaded stud. The TTA is designed to achieve failure loads in excess of 115% of the characteristic strength of grade 500 rebar and meets the requirements of BS EN 1992-1-1:2004 (Eurocode 2) and BS 8110 for mechanical splices.

Testing & Approvals
The Headed Anchor range of Tapered Thread couplers has been independently tested to demonstrate compliance with the following codes:

- DIBt Approval No. Z-1.5-179 - Sections 12.6 and 12.8 of DIN 1045-1:2008-08 and Sections 8.4 and 8.7 of DIN EN 1992-1-1/NA.
- ÚA Approval No. R-2.1.9-17-15658
- ITB Approval No. AT-15-9037/2013

Note: Not all coupler types, sizes and torque values 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.

Torque Wrenches

<table>
<thead>
<tr>
<th>Torque Wrenches for Couplers and Locknuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
</tr>
<tr>
<td>Torque (Nm)</td>
</tr>
</tbody>
</table>

Bar Diameter (mm) | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 40 | 50 |
<table>
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<td>24</td>
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<td>36</td>
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<tr>
<td>Coupler Length (mm)</td>
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<td>68</td>
<td>50</td>
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<td>30</td>
<td>36</td>
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<td>54</td>
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<tr>
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<td>M20x2.5</td>
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<td>M36x4.0</td>
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<tr>
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<td>0.21</td>
<td>0.40</td>
<td>0.61</td>
<td>1.37</td>
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</tbody>
</table>

Bar Diameter (mm) | 12/14 | 14/16 | 16/18 | 16/20 | 18/20 | 20/22 | 20/25 | 20/28 | 22/25 | 25/28 | 28/30 | 30/34 | 32/40 | 34/40 | 40/50 |
<table>
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<td>Positional Coupler</td>
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<td>110</td>
<td>135</td>
<td>165</td>
<td>205</td>
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<td>265</td>
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<td>80</td>
<td>85</td>
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<td>100</td>
<td>105</td>
<td>110</td>
<td>130</td>
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Bar Diameter (mm) | 12/14 | 16/18 | 16/20 | 18/20 | 20/22 | 20/25 | 20/28 | 22/25 | 25/28 | 26/30 | 29/34 | 30/34 | 32/40 | 34/40 | 40/50 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Tapered Thread Parallel Thread Adaptor Dimensions

<table>
<thead>
<tr>
<th>Bar Diameter (mm)</th>
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<th>16</th>
<th>20</th>
<th>25</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Dia. (mm)</td>
<td>d</td>
<td>25</td>
<td>28</td>
<td>26</td>
<td>42</td>
</tr>
<tr>
<td>Coupler Length (mm)</td>
<td>l</td>
<td>56</td>
<td>68</td>
<td>78</td>
<td>95</td>
</tr>
<tr>
<td>Parallel Thread Length (mm)</td>
<td>l_p</td>
<td>24</td>
<td>30</td>
<td>36</td>
<td>45</td>
</tr>
<tr>
<td>Parallel Thread Size</td>
<td>d_p</td>
<td>M16x2.0</td>
<td>M20x2.5</td>
<td>M24x3.0</td>
<td>M30x3.5</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.14</td>
<td>0.21</td>
<td>0.40</td>
<td>0.61</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Part No. | TTA12 | TTA16 | TTA20 | TTA25 | TTA32 |

Torque Wrenches

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<tr>
<td>Part No.</td>
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<td>Torque (Nm)</td>
</tr>
</tbody>
</table>

Tel: +44 (0) 114 275 5224  www.ancon.co.uk
Accessories

Threading Machine
The Ancon threading machine provides a fast, simple and reliable threading operation. The machine is compact, making it completely portable and easy to locate. It is of a robust design to provide a long, low maintenance life. Threading machines are generally located in stockists’ yards. For larger projects Ancon machines can be made available for hire. Please contact Ancon for further information. Training on the correct usage of the threading machine is provided by Ancon technicians.

Machine Consumables
The following consumables are available:
Chaser Sets
Chaser sets are available on a regrindable or disposable basis. Each set can be reground up to 3 times in order to extend cutting life. Please contact Ancon for details.
Coolant
Ancon recommends the use of Pencool 5900 Cutting Fluid or a similar water based coolant.
Thread Protectors
Plastic sleeves are available to protect the tapered threads on reinforcing bars.
Torque Wrenches
In order to ensure the correct assembly of tapered thread couplers the use of a calibrated torque wrench is essential. Details of wrenches are included in the table opposite. Each Ancon wrench is supplied with a certificate of calibration.

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.
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.