FORTEC

PRODUCT DATASHEET

DM-PDS-026 FORTEC® Rev.06_en March 2023

Dextra

40 FORWARD

CONTENT

Product Description

The Fortec reinforcing bar end preparation system is a patented cold-upsetting and threading process that guarantees a resistant cross-section area larger than that of the parent bar.

The Fortec system uses isometric parallel threads, so its mechanical performance in compression equals that in tension.

The thread may be cut (= “Fortec” mechanical splice) or rolled (= “Fortec R” mechanical splice) onto the end of the bar.

The Fortec system is the easiest way of connecting two bars that cannot be turned, a feature known as “Position splicing”.

The Fortec system conveniently uses the same coupler to do standard splices or position splices. The difference between both splices is limited to the length of the thread done on the bar.

The same bar end preparation can also accommodate an anchor plate in order to create a headed bar.

Fortec mechanical connections have been designed to far surpass the requirements of all international codes and standards:

The FORTEC splicing system creates a full strength connection of grade 500 reinforcement bars with a guaranteed tensile strength higher than the nominal ultimate tensile strength of the bar.

The surface condition of Fortec couplers and anchor plates conforms to ACI 318 § 7.4.2, ACI 349 § 7.4, ASME Section III Division 2 § CC 4360 and B.S. 5400 Part 7 § 4.5. Weldable couplers furthermore conform to ANSI/AWS D1.1-88 § 3.2.1.

Fortec couplers and anchor plates can be galvanised or epoxy-coated by any means. Their internal threads must be protected before processing.

FORTEC

The only rebar splice that maintains the full ductility of the reinforcing bar while using the same coupler for standard and position connections.

Fortec couplers are sold under the name “Bartec” in some countries.

CAD & BIM

CAD & BIM tools to support design engineers in the drawing and modelling of strutures are available in the download section of www.dextragroup.com

For designer tools support, contact us at: cadbim@dextragroup.com

Tekla

AUTODESK AUTOCAD

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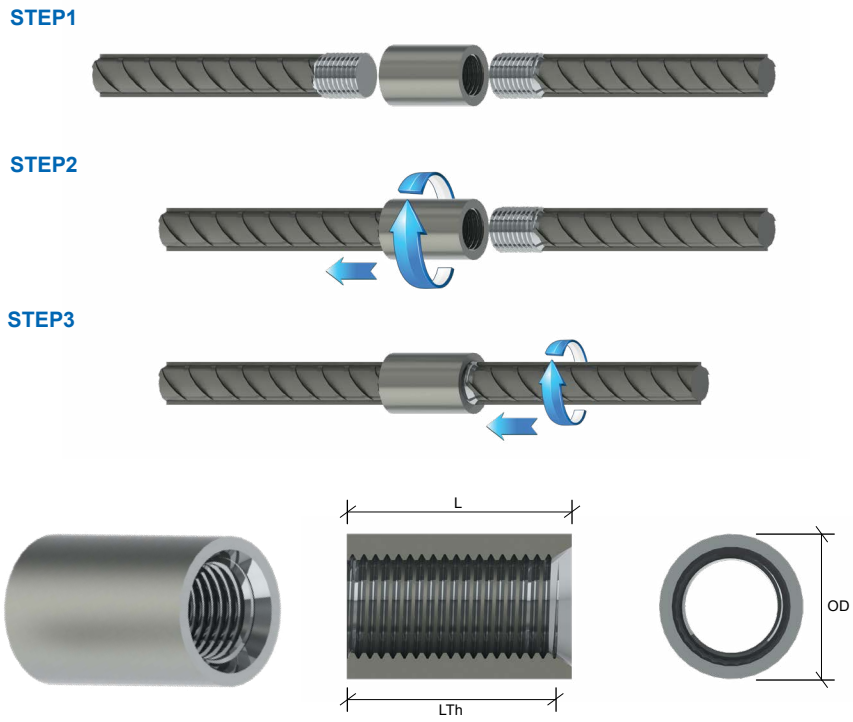
Standard splices (Type A)

The Fortec mechanical splice system consists in enlarging the reinforcing bar ends by cold-upsetting prior to threading them. Extra-long threads are used to assist alignment, or when joining bars that cannot be turned. All applications can thus be fulfilled by only one model of coupler, thereby reducing inventory management to a minimum.

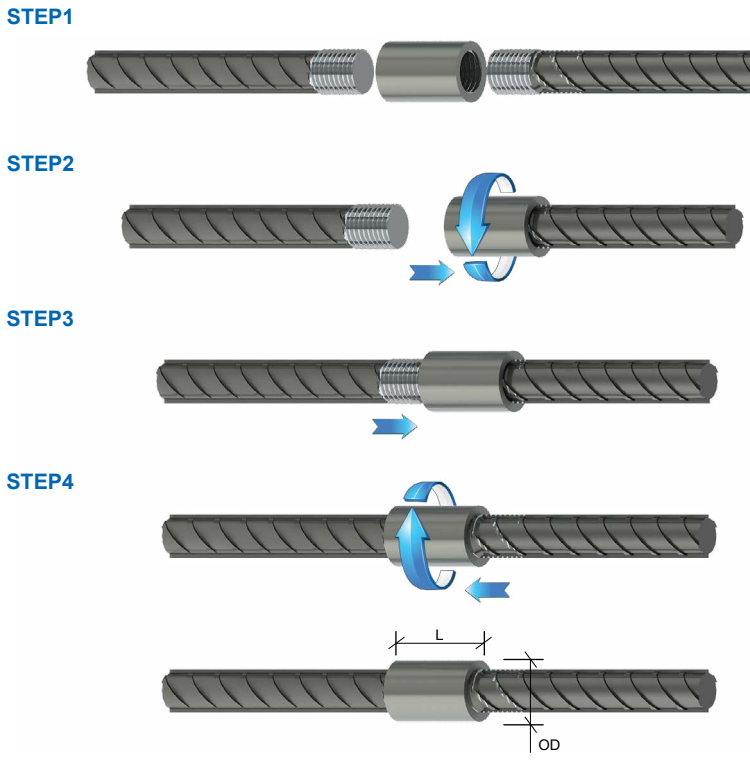
Standard Fortec splices are accomplished by use of a standard female coupler matching the thread size made on the bars. The continuation bar is rotated in order to achieve the connection.



See Assembly instruction n° AI-FT-01E.

Position Splices (Type B)

When both bars would be a burden to rotate, for example because of their size or length, the Fortecsplice system simply extends the thread onto the ribs of the bar, thereby enabling the coupler to be fully screwed onto it. It is then unscrewed from the first phase bar onto the second phase bar to accomplish the connection.



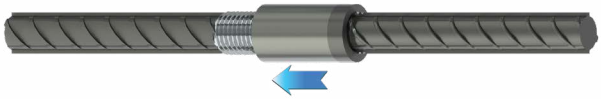
See Assembly instruction n° AI-FT-02E

Position Splices (Type C)

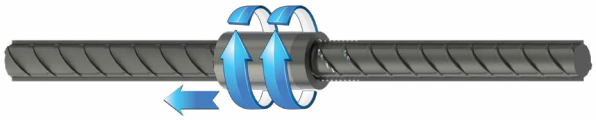
STEP1

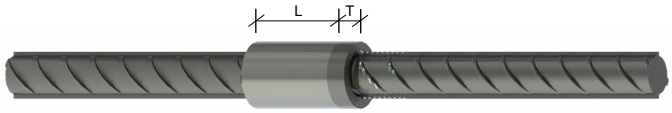
STEP2

STEP3

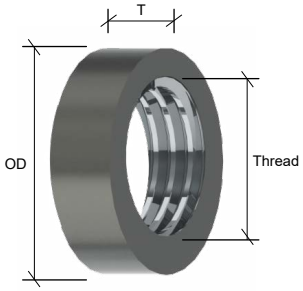


STEP4





Type C position splices are type B connections where the thread has been further extended to accommodate a lock nut. They are ideal when the second bar is bent and must be locked in a specific direction.



Position splice type C
See Assembly instruction n° AI-FT-03E.

Lock nuts

Bar size	Method used to thread the bar	Product code Fortec standard coupler	Approximate dimensions (mm)		
			OD	L	LTh
12	Cut/Rolled	FPBF1214201	20	28	26
14	Cut/Rolled	FPBF1416201	24	36	32
16	Cut/Rolled	FPBF1620255	26	44	39
18	Cut/Rolled	FPBF1822251	34	49	44
20	Cut/Rolled	FPBF2024305	31	52	47
22	Cut/Rolled	FPBF2227305	39	66	59
25,26	Cut/Rolled	FPBF2530355	39	66	59
28,30	Cut/Rolled	FPBF2833355	44	71	64
32	Cut/Rolled	FPBF3236405	48	78	70
34	Cut	FPBF3639405	60	86	82
36	Rolled				
	Cut	FPBF3642455	55	90	82
38	Cut	FPBF3842451	62	89	84
40	Rolled	FPBF4045355	60	97	88
	Cut	FPBF4045455*			
		FPBF4045457*			
50	Rolled	FPBF5053402	75	114	104
	Cut	FPBF5056552	75	120	110

Table 1: Dimensions of Fortec Standard couplers as used for A,B,C connections.
**Note for bar size 40 : These two references are for the same product, but packed in different quantities : See table*

Bar size	Method used to thread the bar	Product code Fortec lock nut	Approximate external dimensions (mm)	
			OD	T
12	Cut/Rolled	FPBL1214002	20	10
14	Cut/Rolled	FPBL1416002	24	10
16	Cut/Rolled	FPBL1620002	28	10
18	Cut/Rolled	FPBL1822002	30	10
20	Cut/Rolled	FPBL2024002	32	10
22	Cut/Rolled	FPBL2527002	36	13.5
25,26	Cut/Rolled	FPBL2530002	40	12
28,30	Cut/Rolled	FPBL2833002	45	16.5
32	Cut/Rolled	FPBL3236002	50	15
34	Cut	FPBL1139002	55	16.5
36	Rolled			
	Cut	FPBL3642002	58	21
38	Cut	FPBL3642002	58	21
40	Rolled	FPBL1445002	62	18
	Cut	FPBL4045002		
50	Rolled	FPBF5053402	75	26
	Cut	FPBL5056002	75	22.5

Table 2: Dimensions of Fortec lock nuts (Type C only)

Caging Splices

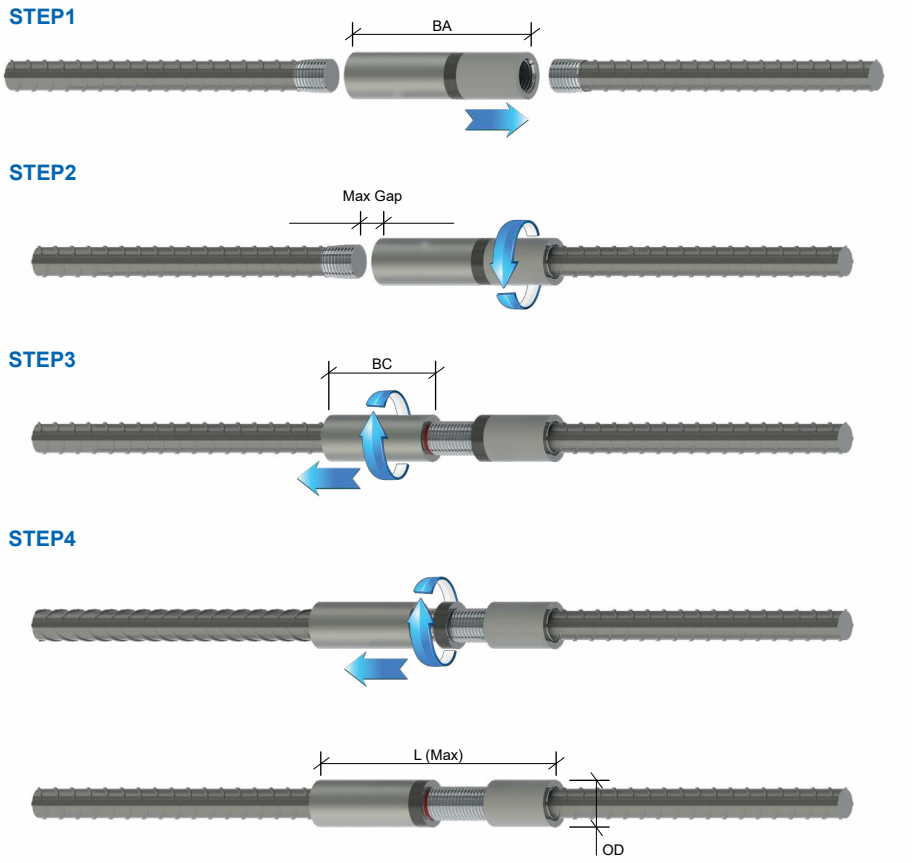
Connection of single bars

When the bars cannot be brought butt to butt (as it happens often in cages manufacturing), Fortec Caging splices are the answer. Both bars are threaded with a standard Fortec thread, and a “Caging Assembly Set” is used to connect them.

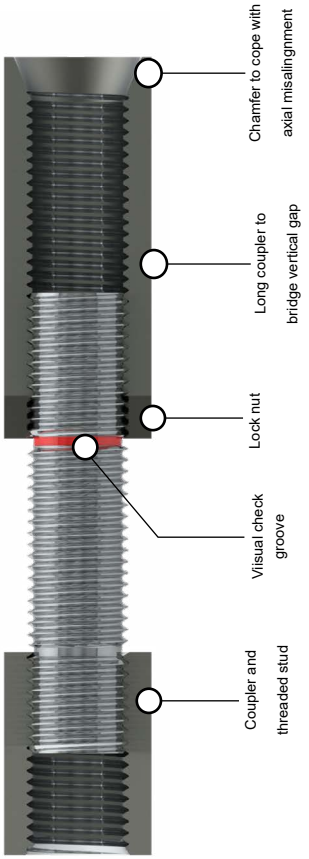
This set is constituted of 3 pieces pre-assembled together: a caging stud, a long bridging coupler and a lock-nut. The end of the caging stud bears a female thread that fits on one bar (Preferably the top bar in case of vertical cages).

To connect the two bars, the bridging coupler is unscrewed from its stud and is screwed onto the second bar. Gaps between the two bar ends can be bridged by this system: The gap should not exceed the values in table 3.

If one of the bars is concreted before assembly of the reinforcement, its thread must be protected by a pocket former (See page 12).



See Assembly instruction n° AI-FT-07E.



Fortec Caging assembly set

Bar size	Method used to thread the bar	Product code Fortec Caging assembly	Approximate external dimensions (mm)			Max gap (mm)	L Max
			D	BA	BC		
16	Cut/Rolled	FPBB1620253	28	120	66	16	166
20	Cut/Rolled	FPBB2024303	32	140	78	20	198
22	Cut/Rolled	FPBB2227303	39	166	86	22	229
25,26	Cut/Rolled	FPBB2530353	40	175	97	25	242
28, 30	Cut/Rolled	FPBB2833353	45	196	108	28	274
32	Cut/Rolled	FPBB3236003	50	213	120	32	297
34	Cut	FPBB1139403	60	235	132	36	328
36	Rolled						
	Cut	FPBB3642453	58	250	138	36	345
40	Rolled	FPBB4045353	70	268	153	43	378
	Cut	FPBB4045453	62	275	160	50	390
50	Rolled	FPBB5053403	75	321	181	50	451
	Cut	FPBB5056553	75	340	197	60	480

Table 3 : Dimensions of Fortec Caging splices

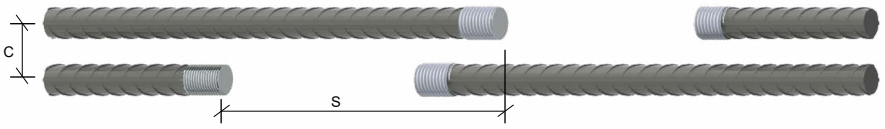
Connection of bundled bars

To connect bundled bars with this system, a minimum spacing should be maintained between the bar ends in order to accommodate the thickness of the coupler, and the bar ends should be staggered so that the movement of the bridging couplers is not obstructed by the neighbouring bar.

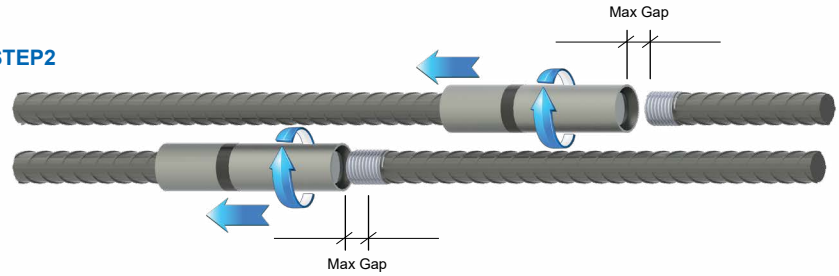
The minimum values for spacing and staggering are given in table 4. The spacing “c” is the centre-to-centre value. The staggering length “s” is from bar end to bar end.

There is no need to stagger the bars if the centre-to-centre spacing is more than both the diameter of the couplers and the dimension of the lock nut.

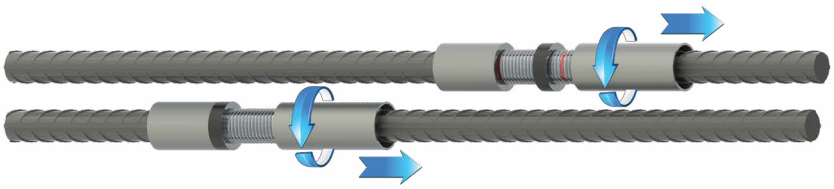
STEP1



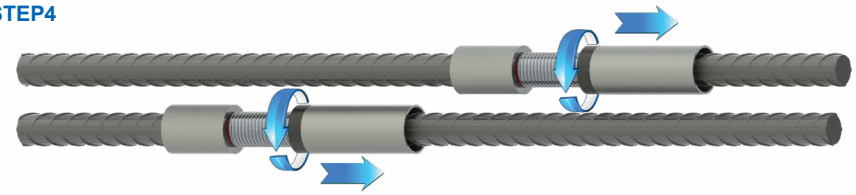
STEP2



STEP3



STEP4



Bar size	Method used to thread the bar	Min. bar spacing C (mm)		Min. bar staggering S (mm)
		No Staggering	Staggering	
16	Cut/Rolled	33	27	167
20	Cut/Rolled	37	31	200
22	Cut/Rolled	45	35.8	226
25,26	Cut/Rolled	45	38	243
28, 30	Cut/Rolled	50	42	276
32	Cut/Rolled	55	46	299
34	Cut	65	52	328
36	Rolled			
	Cut	63	52	348
40	Rolled	75	60	378
	Cut	67	56	392
50	Rolled	85	70	451
	Cut	85	70	483

Table 4 : Spacing and staggering for connection of bundled bars.

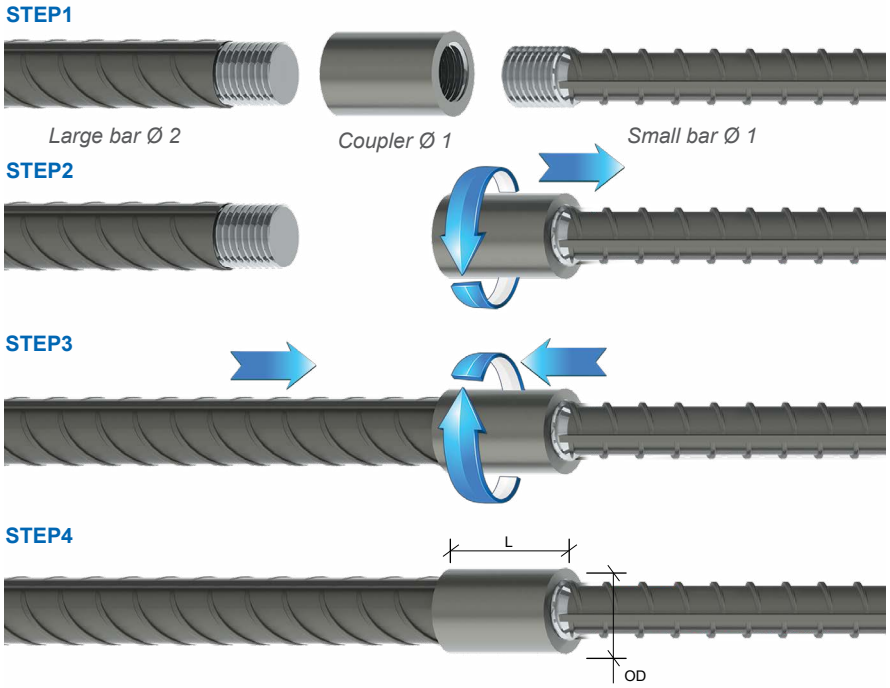
Transition Splices

Transition splices are splices of bars of different nominal diameters.

Transition Splices via the bar (Cut threads only)

For bars with cut threads, it is allowable, and possible in many cases (Refer to the table below) to reduce the size of the larger bar and use a standard coupler.

If none of the bars can be rotated (Position-Transition splices), make the extended thread (Type B or type C) on the smaller bar.

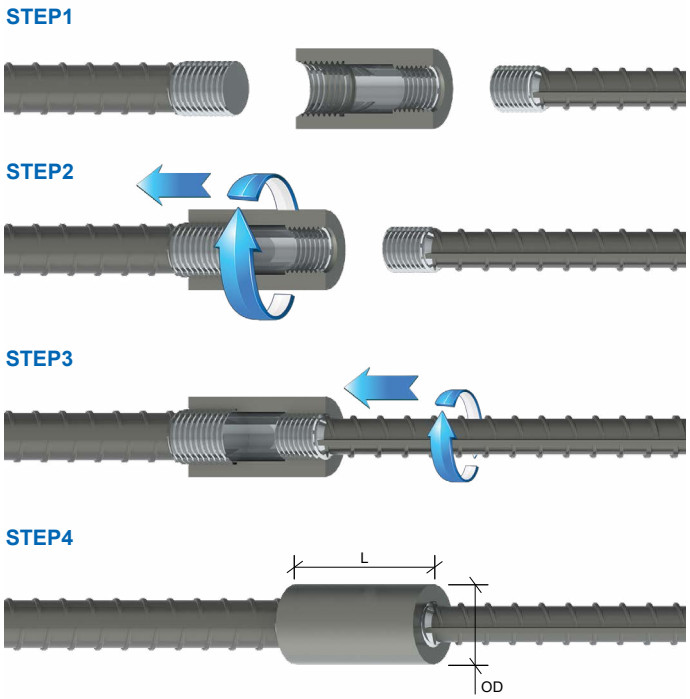


Bar size	Method used to thread the bar	Feasibility	Thread
16/12	Cut/Rolled	OK	M14 on Ø 16
20/14	Cut/Rolled		M16 on Ø 20
25/20	Cut/Rolled		M24 on Ø 25
28/22	Cut/Rolled		M27 on Ø 28
32/25	Cut/Rolled		M30 on Ø 32
36/28	Cut		M33 on Ø 36
43/36	Cut		M42 on Ø 43
50/43	Cut/Rolled		M48 on Ø 50
20/18	Cut/Rolled	OK	
20/16	Cut/Rolled		
22/20	Cut/Rolled		
25/22	Cut/Rolled	Both bar ends need to be forged. Die pockets of Fortec R are required.	
28/25	Cut/Rolled		
32/28	Cut/Rolled		
36/32	Cut		
40/36	Cut		
25/16	Cut/Rolled	OK with Caution	
40/25	Cut	The larger bar must be threaded in 2 or 3 times. The threading head must be re-adjusted between the 2 or 3 times. The processing time will be significantly larger and the wear & tear of tools significantly higher. This job should be done by the most skilled operator. The coupler chamfer must be on the side of the smaller bar.	
40/28	Cut		
40/32	Cut/Rolled		
50/40	Cut/Rolled		

Table 5: Fortec Direct Transitions

Transition Splices via the coupler

For bars with rolled threads, as well as some combinations of bars with cut threads, special transition couplers are necessary.



See Assembly instruction n° AI-FT-05E.

Some of these couplers can be used to make Position - Transition splices (for cases where none of the bars can be rotated) : See the rght-most column table 6

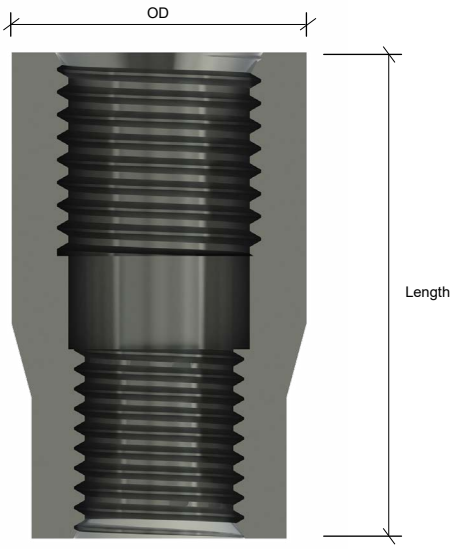
Make the extended thread (Type B or Type C) on the smaller bar.

Bar size		Method used to thread the bar	Product code Fortec Transition coupler	Approximate external dimensions (mm)	
Large	Small			D	L
14	12	Cut/Rolled	FPBT1412003	24	38
16	14	Cut/Rolled	FPBT1614003	26	46
20	12	Cut/Rolled	FPBT2012003	30	50
20	14	Cut/Rolled	FPBT2014003	30	52
20	16	Cut/Rolled	FPBT2016003	30	56
22	16	Cut/Rolled	FPBT2216003	36	59
22	20	Cut/Rolled	FPBT2220003	38	63
24,25,26	16	Cut/Rolled	FPBT2516003	38	64
24,25,26	20	Cut/Rolled	FPBT2520003	38	68
24,25,26	22	Cut/Rolled	FPBT2522003	45	71
28,30	16	Cut/Rolled	FPBT2816003	40	67
28,30	20	Cut/Rolled	FPBT2820003	40	71
28,30	22	Cut/Rolled	FPBT2822003	45	74
28,30	24,25,26	Cut/Rolled	FPBT2825003	45	77
32	16	Cut/Rolled	FPBT3216003	45	72
32	20	Cut/Rolled	FPBT3220003	45	76
32	22	Cut/Rolled	FPBT3222003	45	79
32	24,25,26	Cut/Rolled	FPBT3225003	45	82
32	28,30	Cut/Rolled	FPBT3228003	48	85
34/36	22	Cut/Rolled	FPBT3422003	50	82
34/36	24,25,26	Cut/Rolled	FPBT3425003	52	85
34/36	28,30	Cut/Rolled	FPBT3428003	52	88
36	24,25,26	Cut	FPBT3625003	52	90
36	28,30	Cut	FPBT3628003	55	93
36	32	Cut	FPBT3632003	60	96
40	24,25,26	Cut	FPBT4025003	55	93
40	28,30	Cut	FPBT4028003	55	96
40	32	Rolled	FPBT4032001	62	99
40	32	Cut	FPBT4032003	62	99
40	36	Cut	FPBT4036003	62	105
50	32	Cut	FPBT5032003	75	114
50	40	Rolled	FPBT5040001	75	114
50	40	Cut	FPBT5040003	75	123

Table 6: Dimensions of Fortec Transition couplers

Forged Transition Couplers

Depending on quantities and lead time requirements, transition couplers may also be delivered with this alternate design. Please consult us for more information.

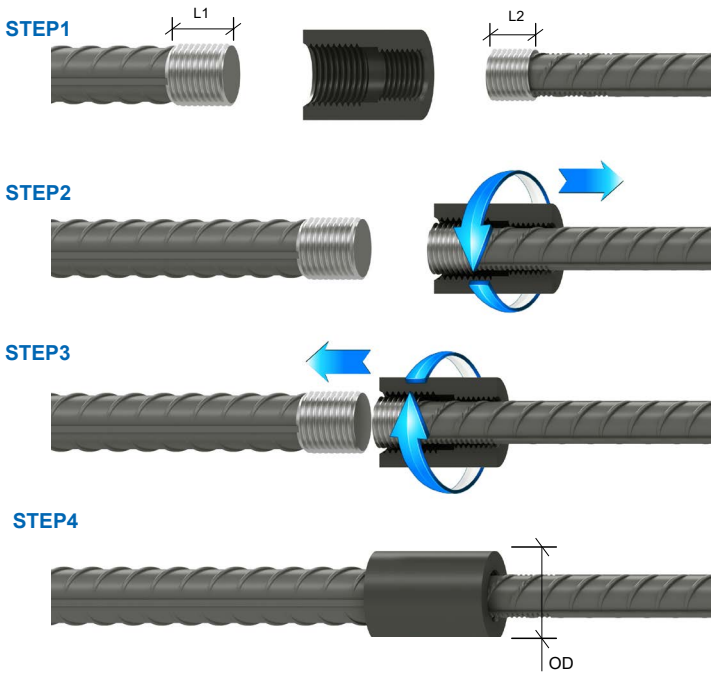


Bar size	Method used to thread the bar	Product code Fortec Transition coupler	Approximate external dimensions (mm)	
			OD	L
32/20	Cut/Rolled	FPDT3220002	50	86
32/22	Cut/Rolled	FPDT3222002	50	86
32/25,26	Cut/Rolled	FPDT3225002	50	86
32/28	Cut/Rolled	FPDT3228002	50	86
40/20	Cut	FPDT4020002	62	100
40/25,26	Cut	FPDT4025002	62	100
40/28	Cut	FPDT4028002	62	100
40/32	Cut/Rolled	FPDT4032002	62	100

Table 7: Dimensions of Fortec Forged Transition couplers

Position-Transition Splices

For most bar size combinations, FORTEC Transition couplers can be used to connect bars of different diameter without having to turn either bar, simply by making an extended thread on the smaller bar.



See Assembly instruction n° AI-BT-15E.

Bar size	Method used to thread the bar	Product code Fortec Transition coupler	Approximate external dimensions (mm)		
			OD	L1	L2
16/14	Cut/Rolled	FPBT1614003	26	22	32
20/12	Cut/Rolled	FPBT2012003	30	32	27
20/14	Cut/Rolled	FPBT2014003	30	32	32
20/16	Cut/Rolled	FPBT2016003	30	32	44
22/16	Cut/Rolled	FPBT2216003	36	32	44
25,26/16	Cut/Rolled	FPBT2516003	38	34	44
25,26/20	Cut/Rolled	FPBT2520003	38	34	51
28,30/16	Cut/Rolled	FPBT2816003	40	37	44
28,30/20	Cut/Rolled	FPBT2820003	40	37	51
28,30/22	Cut/Rolled	FPBT2822003	45	37	65
32/16	Cut/Rolled	FPBT3216003	45	37	44
32/20	Cut/Rolled	FPBT3220003	45	37	51
32/22	Cut/Rolled	FPBT3222003	45	37	65
32/25,26	Cut/Rolled	FPBT3225003	45	37	64
34/22	Cut/Rolled	FPBT3422003	50	40	65
34/25,26	Cut/Rolled	FPBT3425003	52	40	64
34/28,30	Cut/Rolled	FPBT3428003	52	40	69
36/25,26	Cut	FPBT3625003	52	43	64
36/28,30	Cut	FPBT3628003	55	43	69
36/32	Cut	FPBT3632003	60	43	75
40/25,26	Cut	FPBT4025003	55	46	64
40/28,30	Cut	FPBT4028003	55	46	69
40/32	Cut	FPBT4032003	62	46	75
50/32	Cut	FPBT5032003	75	56	75
50/40	Cut	FPBT5040003	75	56	93

Table 8: Dimensions of Fortec Position-Transition splices

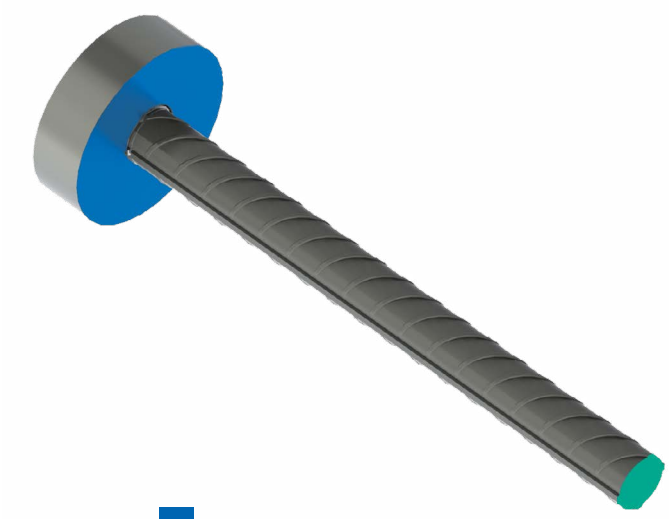
Headed Bars

Development or anchorage of reinforcement is the main use of headed bars. They conveniently replace hooked bars as end anchorages in congested areas. They can also be used to reduce lapping length, or as confinement or shear reinforcement where placing of stirrups is difficult.

Typical applications include exterior beam-column connections, roof corners, pile feet, pile caps, cantilevered members, corbels, etc.

Headed bars can provide full design anchorage by either the head bearing alone or a combination of the head bearing together and rebar bond. The selection of approach will primarily depend on the design standard adopted, the size of the head and the strength of concrete.

Standard BARTEC® mechanical anchorages are circular in shape and are fixed to the end of the rebar by screwing them onto the threaded bar. Two sizes of heads are available:



Surface ratio = Net bearing area / Nominal bar cross section area

- Small heads, with a net bearing area greater than or equal to four times the cross-section area of the reinforcing bar (4A).
- Large heads, with a net bearing area greater than or equal to nine times the cross section area of the reinforcing bar (9A).

When loaded in tension and due to the round shape of the head, a cone of overstressed concrete will develop immediately under the head. If the head is large enough and the concrete is strong enough, the full anchorage design strength can be developed via the head alone. If this is not the case, then a contribution of rebar bond is required, immediately beyond the region of overstressed concrete.

Different codes of practice take different design approaches. Some, for example ACI 318, explicitly allow for a 4A head with a provision for a load contribution to be taken via rebar bond. Others, for example, fib Model Code 2010, give a set of simplified prescriptive rules for a minimum head size of 8A only. EN1992-1-1 (Eurocode 2), does not explicitly cover designing with headed bars.

However, rules can be derived from the provisions for partially loaded areas. For further information on how to design in accordance with Eurocode 2, please see the Arup/Dextra Design Guide.

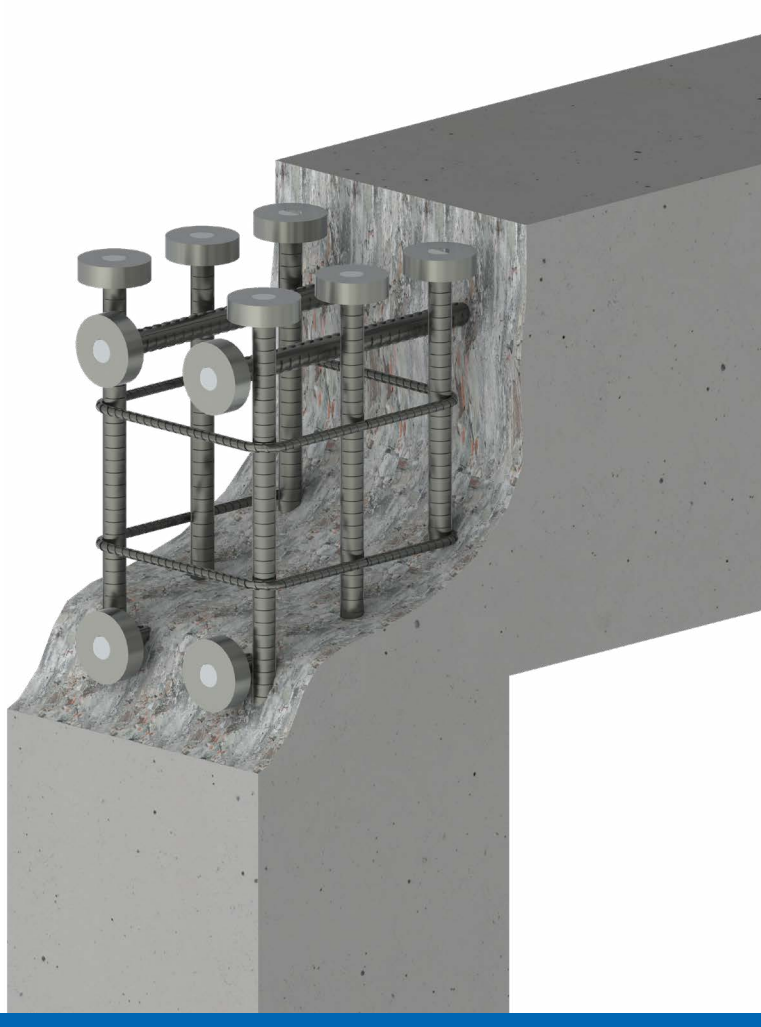
In beam-column connections, headed bars in beam reinforcement should extend to the far side of the column core. In roof corners, the column heads should be located above the beam bars. In both cases this detailing arrangement will provide space for an additional layer of transverse reinforcement, which will further improve the capacity of the anchorage.

Headed bars can be arranged close to one another: Tests have shown that the overlapping of compression cones does not reduce the effectiveness of the anchorage. However, the relevant code of practice should be followed with regards spacing.

For applications in seismic design, or whenever stress reversal can be expected, the anchorage length in compression should be checked too. (Just like hooks, headed bars do not contribute to anchorage in compression, which must therefore be provided by a straight portion of bar as per the code requirement).

Full-scale cyclic tests of beam-column connections reinforced with headed bars have shown that push-out of the concrete behind the head does not occur until a drift ratio of 6%.

See Assembly instruction n° AI-FT04E.



Small Headed bars

Bar size	Method used to thread the bar	Product code Fortec small anchor plate	Approximate external dimensions Small round head			
			OD (mm)	Thickness (mm)	Net bearing area (mm2)	Surface ratio
12	Cut/Rolled	FPEC1214013	30	12	553	4.89
14	Cut/Rolled	FPEC1416203	34	14	707	4.59
16	Cut/Rolled	FPEC1620013	38	18	820	4.08
20	Cut/Rolled	FPEC2024003	48	20	1,357	4.32
22	Cut/Rolled	FPEC2227013	52	24	1,551	4.08
25,26	Cut/Rolled	FPEC2530003	60	26	2,121	4.32
28,30	Cut/Rolled	FPEC2833003	70	28	2,993	4.86
32	Cut/Rolled	FPEC3236003	75	31	3,400	4.23
34	Cut	FPEC1139003	85	35	4,480	4.93
36	Rolled					
	Cut	FPEC3642453	85	36	4,289	4.20
40	Rolled	FPEC4045353	95	45	5,498	4.37
	Cut	FPEC4045003	95	38		
50	Rolled	FPEC5053403	115	50	8,181	4.17
	Cut	FPEC5056553	115	48	7,924	4.04

Table 9: Dimensions of Fortec Small Mechanical Anchorages
(Net bearing area at least 4 times the nominal cross-section area of the bar)

Large Headed bars

Bar size	Method used to thread the bar	Product code Fortec large anchor plate	Approximate external dimensions Large round head			
			OD (mm)	Thickness (mm)	Net bearing area (mm2)	Surface ratio
12	Cut/Rolled	FPEC1214001	42	12	1,232	10.90
14	Cut/Rolled	FPEC1416201	45	14	1,389	9.02
16	Cut/Rolled	FPEC1620001	52	18	1,810	9.00
20	Cut/Rolled	FPEC2024001	65	20	2,866	9.13
22	Cut/Rolled	FPEC2227301	75	24	3,845	10.12
25,26	Cut/Rolled	FPEC2530351	85	25	4,968	10.12
28	Cut/Rolled	FPEC0933001	95	29	6,233	10.12
30	Cut/Rolled	FPEC3033351	100	28	6,999	9.90
32	Cut/Rolled	FPEC3236001	105	32	7,641	9.50
34	Cut	FPEC1139001	115	35	9,192	10.12
36	Rolled					
	Cut	FPEC3642451	120	36	9,924	9.73
40	Rolled	FPEC4045351	130	45	11,683	9.29
	Cut	FPEC4045001	130	38		
50	Rolled	FPEC5053401	160	50	17,900	9.12
	Cut	FPEC5056551	165	48	18,919	9.64

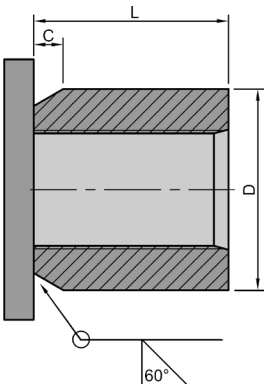
Table 10: Dimensions of Fortec Large Mechanical Anchorages
(Net bearing area at least 9 times the nominal cross-section area of the bar)

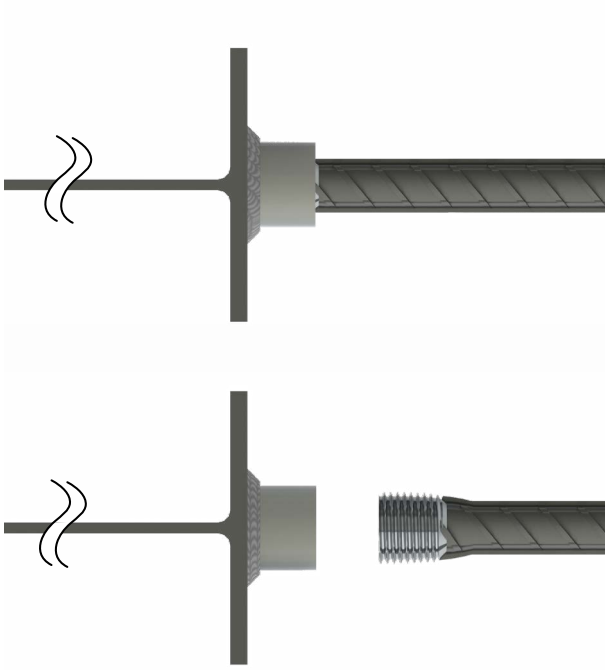
Weldable Couplers

For composite construction where concrete reinforcement bars must be welded to a steel structure, Fortec weldable couplers must be used.

This is a nut made of a weldable-grade steel that bears a large chamfer suitable for single bevel butt welding.

See Assembly instruction n° AI-CW-01E.





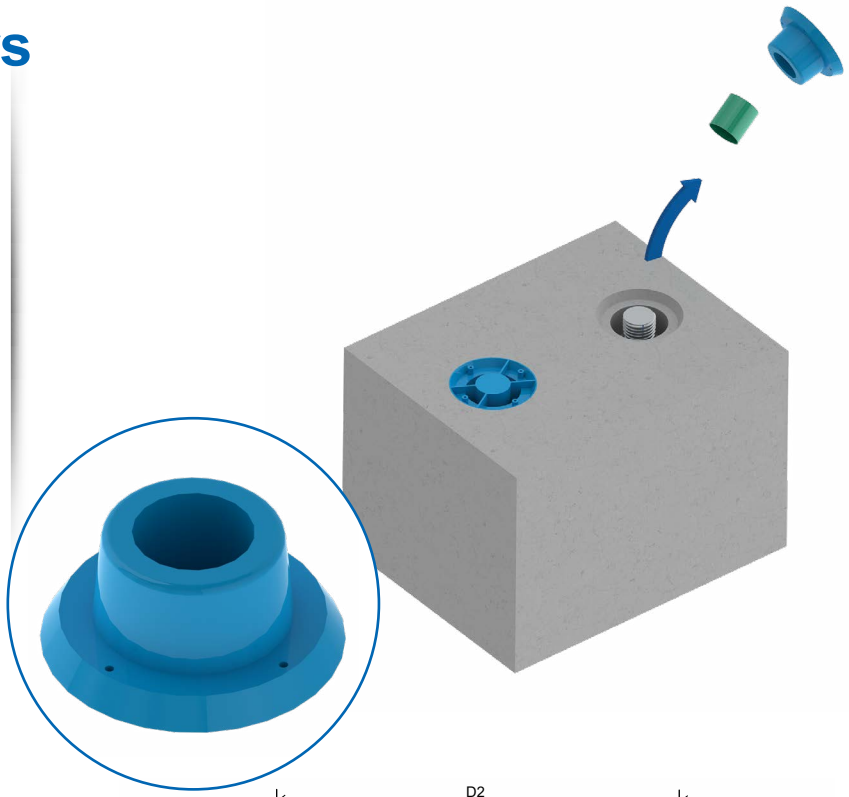
Bar size	Method used to thread the bar	Product code Fortec Weldable coupler	Approximate external dimensions (mm)		
			D	L	C
12	Cut/Rolled	FPWC1214001	22	18	4
14	Cut/Rolled	FPWC1416001	28	27	4
16	Cut/Rolled	FPWC1620001	34	33	5
18	Cut/Rolled	FPWC1822001	38	35	5
20	Cut/Rolled	FPWC2224001	38	36	6
22	Cut/Rolled	FPWC2627001	45	39	6
24,25,,26	Cut/Rolled	FPWC2530001	45	37	7
28,30	Cut/Rolled	FPWC2833001	55	40	7
32	Cut/Rolled	FPWC3236001	55	44	8
34	Cut	FPWC3439001	65	47	8
36	Rolled				
	Cut	FPWC3642001	72	51	9
40	Rolled	FPWC1445001	75	55	7
	Cut	FPWC4045001	72	51	9
50	Cut	FPWC5056001	90	67	11

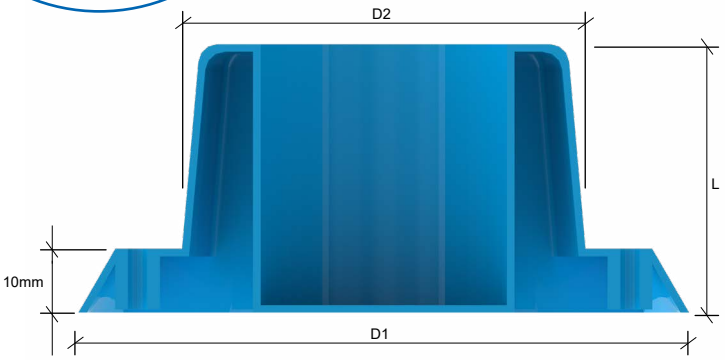
Table 11: Dimensions of Fortec weldable couplers

Pocket Formers

Pocket Formers are plastic accessories that fit the threads of Fortec bars in order to form a reservation in the concrete. They can be nailed to a wooden formwork through the holes in their flange.

It is advisable to apply a mould-release agent to the pocket formers prior to concreting. Simply use the same agent as for the formworks.





Bar size	Method used to thread the bar	Product code Fortec Pocket Former	Approximate external dimensions (mm)		
			D1	D2	L
12	Cut/Rolled	FPPF1214002	61.5	28	18
14	Cut/Rolled	FPPF1416002	61.5	32	20
16	Cut/Rolled	FPPF1620002	71.5	40	25
18	Cut/Rolled	FPPF1822002	71.5	40	24
20	Cut/Rolled	FPPF2024002	77.5	45	29
22	Cut/Rolled	FPPF2227002	85.5	50	26
24,25,26	Cut/Rolled	FPPF2530002	85.5	50	34
28,30	Cut/Rolled	FPPF2833002	85.5	60	41.2
32	Cut/Rolled	FPPF3236002	95.5	60	42
34	Cut	FPPF3439002	115	75	44
36	Rolled				
	Cut	FPPF3642002	115	75	47.5
40	Cut/Rolled	FPPF4045002	115	75	50
50	Rolled	FPPF5053002	115	75	60
	Cut	FPPF5056002	125	85	60

Table 12: Dimensions of Fortec Pocket Formers

Stainless Steel Couplers

Fortec stainless steel couplers are designed to splice BS6744 grade 500 or ASTM A955 grade 60 stainless steel reinforcing bars. They are available in two grades in order to fit with the grade of the bar:

- Fortec austenitic stainless steel couplers are made of grade AISI 316 as per ASTM A276 or X3CrNiMo17-13-3 as per EN 10088-3 (Material number 1.4436).
- Fortec duplex stainless steel couplers are made of grade S31803 or, S32205 as per ASTM A276 or X2CrNiMoN22-5-3 as per EN 10088-3 (Material number 1.4462).

See Assembly instruction n° AI-FT-01E.

CRYOGENIC COUPLERS

For the splicing of cryogenic reinforcing bars, Fortec austenitic stainless steel couplers are recommended.

Bar size	Method used to thread the bar	Product code Fortec austenitic stainless steel coupler	Approximate external dimensions (mm)	
			OD	L
12	Cut/Rolled	FPSB1214003	24	28
14	Cut/Rolled	FPSB1416003	26	32
16	Cut/Rolled	FPSB1620003	30	40
18	Cut/Rolled	FPSB1822003	32	44
20	Cut/Rolled	FPSB2024003	35	48
22	Cut/Rolled	FPSB2227003	40	54
24,25,26	Cut/Rolled	FPSB2530003	45	60
28,30	Cut/Rolled	FPSB2833003	50	66
32	Cut/Rolled	FPSB3236003	55	72
34	Cut	FPSB3439003	60	78
36	Rolled			
	Cut	FPSB3642003	65	84
40	Cut	FPSB4045003	70	90
	Rolled	FPSB4348003	75	90
43	Cut			
50	Cut	FPSB5056003	85	112

Table 13: Dimensions of Fortec austenitic stainless steel couplers

Bar size	Method used to thread the bar	Product code Fortec duplex stainless steel coupler	Approximate external dimensions (mm)	
			OD	L
12	Cut/Rolled	FPSB1214002	20	28
14	Cut/Rolled	FPSB1416002	24	32
16	Cut/Rolled	FPSB1620002	28	40
18	Cut/Rolled	FPSB1822002	30	44
20	Cut/Rolled	FPSB2024002	34	48
22	Cut/Rolled	FPSB2227002	38	54
24,25,26	Cut/Rolled	FPSB2530002	40	60
28,30	Cut/Rolled	FPSB2833002	45	66
32	Cut/Rolled	FPSB3236002	50	72
34	Cut	FPSB3439002	55	78
36	Rolled			
	Cut	FPSB3642002	57	84
40	Cut	FPSB4045002	65	90
	Rolled	FPSB4348002	70	90
43	Cut			
50	Cut	FPSB5056002	80	112

Table 14 Dimensions of Fortec duplex stainless steel couplers

Colour Identification

The plastic caps that protect the threads of Fortec couplers are coloured to enable a quick identification of the bar size and prevent miss-matching of threads.

Bar size	Method used to thread the bar	Colour
12	Cut/Rolled	Yellow
14	Cut/Rolled	Blue
16	Cut/Rolled	Lavender
18	Cut/Rolled	Grey
20	Cut/Rolled	Orange
22	Cut/Rolled	Red
25,26	Cut/Rolled	Clear
28,30	Cut/Rolled	Brown
32	Cut/Rolled	Light Blue
34,36	Cut/Rolled	Yellow
36,38	Cut	Green
40,43	Cut/Rolled	Blue
50	Rolled	Black
	Cut	Brown

Table 15 : Colour of plastic caps

Identification & Traceability

Each load-bearing component is marked with the following symbols that enable to trace it back to its raw material and production batch data.

Marking on coupler circumference :

Prefix	D	XXXXXX	XXXXXX	Suffix
Model & Bar size	DEXTRA	Production batch	Material Lot	T2DCL for some size standard & position couplers. TH for end anchors No suffix for other models
		Traceability No.		

Type of splice	Prefix marking number begin with
Standard splice	BF12D
Caging splice	BB32D
Transition	DT40-32
Transition (forged model)	DTF28-20
Stainless (duplex)	BDS12#4D
Stainless (austenitic)	BAS12#4D
Weldable	WC33D
Small end anchor	BFEAS16D
Large end anchor	BFEAL12D

Table 16 : Marking on coupler circumference
Characters in blue vary upon bar/thread diameter.

Full traceability of the production batches and raw materials is guaranteed for all load-bearing components. The retention period of our quality records is 12 years.

Bar End Preparation

Reinforcing bars are individually prepared by having a FORTEC® thread made on one or both of their ends by a Dextra machine. The machine is preferably installed at a fabricator's workshop. Bar end preparation instructions provided by Dextra must be followed.

Installation

The mechanical connection is achieved by screwing the coupler onto one bar, and then unscrewing onto the second bar. Contrary to taper threads, no torque wrench is necessary, and mis-assembly by crossing threads is impossible. Connections on site must be done as per the correct Assembly Instruction, as referenced in this document for each type of splice. They are available upon request or at www.dextragroup.com/downloads-bim

Approvals

Country	Agency	Certificate N°	Details
	AFCAB	M10/015	Static certification, fatigue for standard and position in dia 12 through 40 mm, Seismic for standard in dia 12 through 40 and position in dia 16 through 40 mm, Static for anchorages in dia 12 through 40 and Caging in dia 20 through 40 mm.
	ROMANIA	Nr 003-01/142-2020	For standard, position type B,C, transition, weldable, anchorages in dia 12 through 40, caging in dia 16 through 40 and pocket former in dia 14 through 40.
	UK Cares	TA1B-5011	For standard, position splices in dia 12 through 40.
	Moscow municipality	RU.MCC.181. 358.36295	For standard, position, weldable splices, and small & large end anchors bars in dia 12 through 40. For transition, splices in dia 20 through 40. For caging splices in dia 16 through 40.
	ITB	ITB-KTO-2019/0863	For standard, position type B, C, transition, weldable, anchorages in dia 12 through 40. For caging splices in dia 16 through 40.
	EMI	20-CPR-385- (C-57/2019)	For standard, position splices in dia 12 through 50.

Table 17: Product certifications.

Quality Assurance

Fortec couplers and anchor plates are manufactured according to strict technical specifications and under a production process that has been certified to comply with the ISO9001, ISO 19443 and ASME NCA-3800 quality assurance standard.

This quality assurance system complies with the requirements ASME NQA-1 and 10CFR50 Appendix B.

Agency		Certificate N°
	The American Society of Mechanical Engineers	QSC-706
	ISO 9001 Bureau Veritas	TH015960 IND.20.6089/QM/U
	ISO 19443 Bureau Veritas	FR071147-1
	UK CARES	1086

Table 18: Quality assurance certificates.

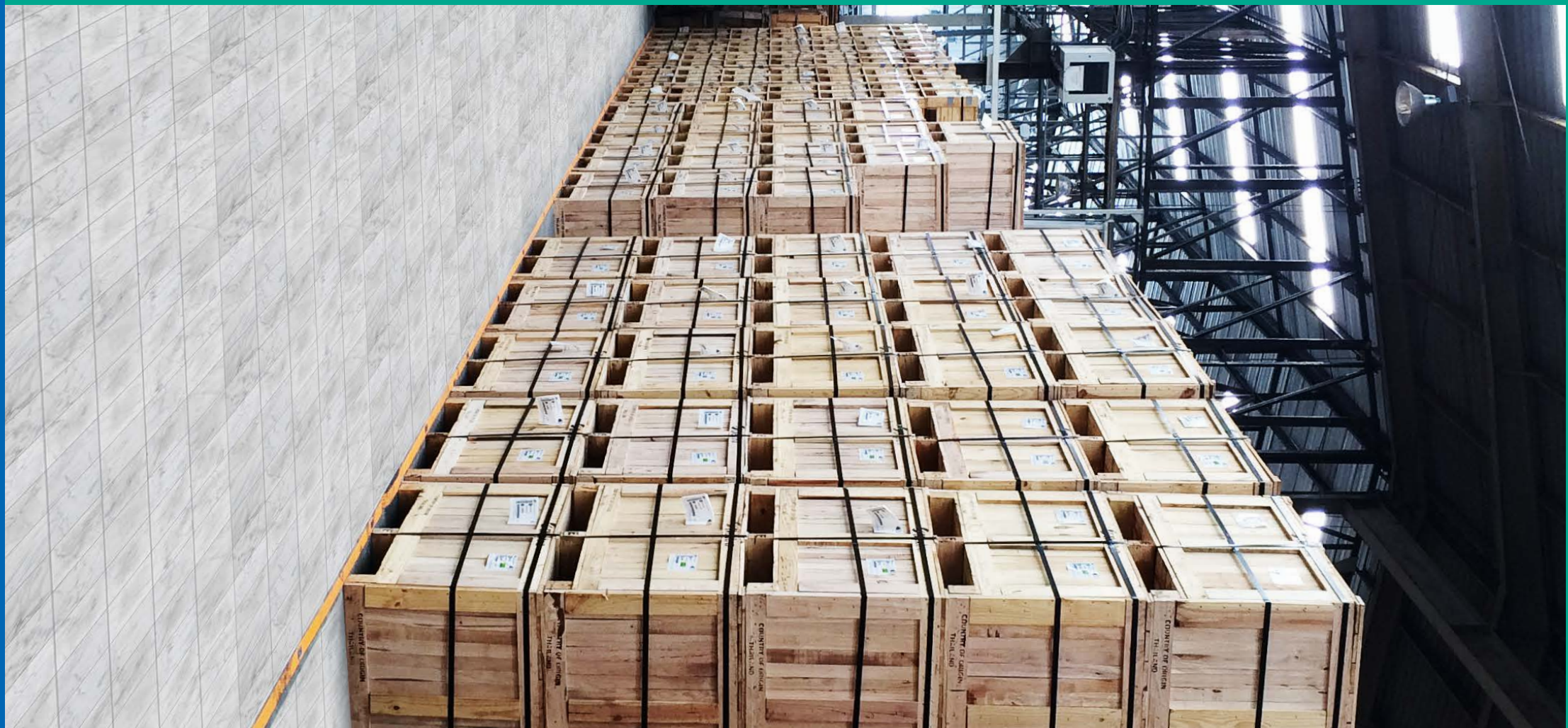
They are warranted to be free from manufacturing defects and to perform in accordance with the manufacturer's specifications provided that they are installed in accordance with our written instructions.

Disclaimer

As a result of our continuous thrive for technological improvement, Dextra reserves its right to modify the contents of this specification sheet at any time without prior notice. In particular, various sources of raw materials may lead to variations in outside diameters. The information provided on this document, and any outside information linked to, is for guidance only.

Dextra products shall be installed and used only as indicated in Dextra's documentation and training materials. Aforementioned documents are available at www.dextragroup.com and from your Dextra customer service representative. Improper installation, misuse, misapplication or other failure to completely follow Dextra's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death. Dextra cannot accept any liability in respect thereof.

PACKING DETAILS



Packing details

Pocket formers are packed in carton boxes. Other products are packed in wooden crates that can be lifted by a forklift.

All products must be stored under a roof and protected from the elements.

Please ensure that order quantities are a multiple of the packaging quantities stated in the following tables.

Wooden box type	Inside	Outside	Weight (kg)
	W x L x H (cm)	W x L x H (cm)	
1	36.6x56.6x25.0	43.4x63.4x43.7	17
2	56.6x76.6x29.0	63.4x83.4x47.7	25
3	76.6x116.6x29.0	83.4x123.4x47.7	39
4	76.6x116.6x45.0	83.4x123.4x63.7	48
5	76.6x116.6x65.0	83.4x123.4x83.7	60

Table 19: Wooden crates dimensions

Note : The weight of the crates varies depending on ambient humidity.

Carton box	Carton box size (mm)	Weight (kg)
Pocket former	400x400x400	1

Table 20: Carton boxes dimensions

Note : The weight of the crates varies depending on ambient humidity.

Fortec Standard couplers >> Page 5

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPBF1214201	1,000	1	40	57
14	Cut/Rolled	FPBF1416201	1,000	1	80	97
16	Cut/Rolled	FPBF1620255	1,000	1	90	107
18	Cut/Rolled	FPBF1822251	1,000	2	220	245
20	Cut/Rolled	FPBF2024305	1,000	2	160	185
22	Cut/Rolled	FPBF2227305	1,000	3	370	409
25,26	Cut/Rolled	FPBF2530355	1,000	3	310	349
28,30	Cut/Rolled	FPBF2833355	1,000	3	420	459
32	Cut/Rolled	FPBF3236405	1,000	4	600	648
34	Cut	FPBF3639405	500	4	470	518
36	Rolled					
	Cut	FPBF3642455	500	4	440	488
38	Cut	FPBF3842451	500	4	620	668
40	Rolled	FPBF4045355	500	4	565	613
	Cut	FPBF4045455	1000	5	1,160	1,220
		FPBF4045457	500	4	580	628
50	Rolled	FPBF5053402	250	3	530	569
	Cut	FPBF5056552	250	3	518	557

Fortec Lock Nuts >> Page 5

Bar size	Method used to thread the bar	Finished code	Qty (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPBL1214002	5,000	1	70	87
14	Cut/Rolled	FPBL1416002	2,500	1	55	72
16	Cut/Rolled	FPBL1620002	2,000	1	54	71
18	Cut/Rolled	FPBL1822002	2,000	1	58	75
20	Cut/Rolled	FPBL2024002	2,000	1	64	81
22	Cut/Rolled	FPBL2527002	1,000	1	54	71
25,26	Cut/Rolled	FPBL2530002	500	1	30	47
28,30	Cut/Rolled	FPBL2833002	500	1	54	71
32	Cut/Rolled	FPBL3236002	500	1	63	80
34	Cut	FPBL1139002	250	1	43	60
34,36	Rolled					
36,38	Cut	FPBL3642002	250	1	58	75
40	Rolled	FPBL1445002	250	1	55	72
	Cut	FPBL4045002	250	1	56	73
50	Rolled	FPBL5053002	100	1	42	59
	Cut	FPBL5056002	100	1	39	56

Fortec Caging couplers >> Page 6

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
16	Cut/Rolled	FPBB1620253	500	2	255	280
20	Cut/Rolled	FPBB2024303	500	2	410	435
22	Cut/Rolled	FPBB2227303	500	3	725	764
25,26	Cut/Rolled	FPBB2530353	500	3	785	824
28,30	Cut/Rolled	FPBB2833353	400	3	892	931
32	Cut/Rolled	FPBB3236003	400	4	1,192	1,240
34	Cut	FPBB1139403	200	3	958	997
36	Rolled					
	Cut	FPBB3642453	200	3	932	971
40	Rolled	FPBB4045353	200	4	1,352	1,400
	Cut	FPBB4045453	200	4	1,196	1,244
50	Rolled	FPBB5053403	100	4	1,002	1,050
	Cut	FPBB5056553	100	4	1,058	1,106

Fortec Transition couplers >> Page 9

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
14/12	Cut/Rolled	FPBT1412003	250	1	23	40
16/14	Cut/Rolled	FPBT1614003	250	1	28	45
20/12	Cut/Rolled	FPBT2012003	250	1	38	55
20/14	Cut/Rolled	FPBT2014003	250	1	40	57
20/16	Cut/Rolled	FPBT2016003	250	1	40	57
22/16	Cut/Rolled	FPBT2216003	250	1	70	87
22/20	Cut/Rolled	FPBT2220003	250	1	83	100
24,25,26/16	Cut/Rolled	FPBT2516003	250	1	80	97
24,25,26/20	Cut/Rolled	FPBT2520003	250	1	80	97
24,25,26/22	Cut/Rolled	FPBT2522003	250	1	143	160
28,30/16	Cut/Rolled	FPBT2816003	250	1	85	102
28,30/20	Cut/Rolled	FPBT2820003	250	1	88	105
28,30/22	Cut/Rolled	FPBT2822003	250	2	135	160
28,30/24,25,26	Cut/Rolled	FPBT2825003	250	2	135	160
32/16	Cut/Rolled	FPBT3216003	250	2	125	150
32/20	Cut/Rolled	FPBT3220003	250	2	128	153
32/22	Cut/Rolled	FPBT3222003	250	2	130	155
32/24,25,26	Cut/Rolled	FPBT3225003	250	2	128	153
32/28,30	Cut/Rolled	FPBT3228003	250	2	160	185
34,36/22	Cut/Rolled	FPBT3422003	250	2	175	200
34,36/24,25,26	Cut/Rolled	FPBT3425003	250	2	205	230
34,36/28,30	Cut/Rolled	FPBT3428003	250	2	203	228
36/24,25,26	Cut	FPBT3625003	250	2	195	220
36/28,30	Cut	FPBT3628003	250	2	240	265
36/32	Cut	FPBT3632003	250	2	325	350
40/24,25,26	Cut	FPBT4025003	250	2	223	248
40/28,30	Cut	FPBT4028003	250	2	225	250
40/32	Cut	FPBT4032003	250	3	348	387
40/32	Rolled	FPBT4032001	250	3	345	384
40/36	Cut	FPBT4036003	250	3	345	384
50/32	Cut	FPBT5032003	250	3	590	629
50/40	Rolled	FPBT5040001	250	3	588	627
	Cut	FPBT5040003	250	3	605	644

Fortec Forged Transition couplers >> Page 10

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
32/20	Cut/Rolled	FPDT3220002	500	3	360	399
32/22	Cut/Rolled	FPDT3222002	500	3	345	384
32/25,26	Cut/Rolled	FPDT3225002	500	3	330	369
32/28	Cut/Rolled	FPDT3228002	500	3	315	354
40/20	Cut	FPDT4020002	250	3	330	369
40/25,26	Cut	FPDT4025002	250	3	315	354
40/28	Cut	FPDT4028002	250	3	305	344
40/32	Cut/Rolled	FPDT4032002	250	3	298	337

Fortec Small Headed bars >> Page 13

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPEC1214013	500	1	30	47
14	Cut/Rolled	FPEC1416203	500	1	40	57
16	Cut/Rolled	FPEC1620013	500	1	65	82
20	Cut/Rolled	FPEC2024003	500	1	115	132
22	Cut/Rolled	FPEC2227013	500	1	155	172
25,26	Cut/Rolled	FPEC2530003	500	2	230	255
28,30	Cut/Rolled	FPEC2833003	500	2	345	370
32	Cut/Rolled	FPEC3236003	250	2	218	243
34	Cut	FPEC1139003	250	2	335	360
36	Rolled					
	Cut	FPEC3642453	250	2	333	358
40	Rolled	FPEC4045353	250	3	523	562
	Cut	FPEC4045003	250	2	448	473
50	Rolled	FPEC5053403	200	3	686	725
	Cut	FPEC5056553	200	3	644	683

Fortec Large Headed bars >> Page 13

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPEC1214001	500	1	60	77
14	Cut/Rolled	FPEC1416201	500	1	80	97
16	Cut/Rolled	FPEC1620001	500	1	135	152
20	Cut/Rolled	FPEC2024001	500	2	235	260
22	Cut/Rolled	FPEC2227301	500	2	380	405
25,26	Cut/Rolled	FPEC2530351	500	3	540	579
28	Cut/Rolled	FPEC0933001	500	3	775	814
30	Cut/Rolled	FPEC3033351	500	3	840	879
32	Cut/Rolled	FPEC3236001	250	2	520	545
34	Cut	FPEC1139001	250	3	680	719
36	Rolled					
	Cut	FPEC3642451	250	3	755	794
40	Rolled	FPEC4045351	200	3	876	915
	Cut	FPEC4045001	200	3	748	787
50	Rolled	FPEC5053401	100	3	742	781
	Cut	FPEC5056551	100	3	757	796

Fortec Weldable couplers >> Page 14

Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPWC1214001	250	1	10	27
14	Cut/Rolled	FPWC1416001	250	1	25	42
16	Cut/Rolled	FPWC1620001	250	1	43	60
18	Cut/Rolled	FPWC1822001	250	1	58	75
20	Cut/Rolled	FPWC2224001	250	1	55	72
22	Cut/Rolled	FPWC2627001	250	1	85	102
24,25,26	Cut/Rolled	FPWC2530001	250	1	73	90
28,30	Cut/Rolled	FPWC2833001	250	2	130	155
32	Cut/Rolled	FPWC3236001	250	2	130	155
34	Cut	FPWC3439001	250	2	210	235
36	Rolled					
	Cut	FPWC3642001	250	2	288	313
40	Rolled	FPWC1445001	250	2	328	353
	Cut	FPWC4045001	250	2	283	308
50	Cut	FPWC5056001	250	3	548	587

Fortec Pocket Formers >> Page 15

Bar size	Method used to thread the bar	Finished code	Qty (pcs)	Carton box size	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPPF1214002	500	400x400x400	5	6
14	Cut/Rolled	FPPF1416002	500	400x400x400	5	6
16	Cut/Rolled	FPPF1620002	250	400x400x400	4	5
18	Cut/Rolled	FPPF1822002	250	400x400x400	4	5
20	Cut/Rolled	FPPF2024002	250	400x400x400	4	5
22	Cut/Rolled	FPPF2227002	100	400x400x400	2	3
24,25,26	Cut/Rolled	FPPF2530002	100	400x400x400	2	3
28,30	Cut/Rolled	FPPF2833002	100	400x400x400	3	4
32	Cut/Rolled	FPPF3236002	100	400x400x400	3	4
34	Cut	FPPF3439002	50	400x400x400	2	3
36	Rolled					
	Cut	FPPF3642002	50	400x400x400	2	3
40	Cut/Rolled	FPPF4045002	50	400x400x400	2	3
50	Rolled	FPPF5053002	50	400x400x400	2	3
	Cut	FPPF5056002	50	400x400x400	3	4

Note : FCL shipments may be palletised, whereas LCL shipments must be boxed.

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Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPSB1214003	250	1	18	35
14	Cut/Rolled	FPSB1416003	250	1	23	40
16	Cut/Rolled	FPSB1620003	250	1	33	50
18	Cut/Rolled	FPSB1822003	250	1	40	57
20	Cut/Rolled	FPSB2024003	250	1	53	70
22	Cut/Rolled	FPSB2227003	250	1	78	95
24,25,26	Cut/Rolled	FPSB2530003	250	2	113	138
28,30	Cut/Rolled	FPSB2833003	250	2	155	180
32	Cut/Rolled	FPSB3236003	250	2	208	233
34	Cut	FPSB3439003	250	2	268	293
36	Rolled					
	Cut	FPSB3642003	250	3	343	382
40	Cut	FPSB4045003	250	3	425	464
	Rolled	FPSB4348003	250	3	520	559
43	Cut					
50	Cut	FPSB5056003	250	4	758	806

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Bar size	Method used to thread the bar	Finished code	QTY (pcs)	Box type	Net weight (kg)	Gross weight (kg)
12	Cut/Rolled	FPSB1214002	250	1	10	27
14	Cut/Rolled	FPSB1416002	250	1	18	35
16	Cut/Rolled	FPSB1620002	250	1	28	45
18	Cut/Rolled	FPSB1822002	250	1	33	50
20	Cut/Rolled	FPSB2024002	250	1	48	65
22	Cut/Rolled	FPSB2227002	250	1	65	82
24,25,26	Cut/Rolled	FPSB2530002	250	1	75	92
28,30	Cut/Rolled	FPSB2833002	250	1	105	122
32	Cut/Rolled	FPSB3236002	250	2	148	173
34	Cut	FPSB3439002	250	2	198	223
36	Rolled					
	Cut	FPSB3642002	250	2	215	240
40	Cut	FPSB4045002	250	3	333	372
	Rolled	FPSB4348002	250	3	420	459
43	Cut					
50	Cut	FPSB5056002	250	4	615	663

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