



TAPER-LOCK® HUBS & ADAPTORS

WELD-ON HUBS
BOLT-ON HUBS
ADAPTORS FOR PARALLEL BORES

PAGE 284

METRIC / IMPERIAL TAPER-LOCK® BUSHES

OVER 460 BUSH/BORE COMBINATIONS
EASY ON/OFF
ELIMINATES BORING/KEYWAYING
'4-HOLE' BALANCED ASSEMBLES

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TAPER-LOCK® ENGINEERING

MINIMUM HUB DIAMETERS
SLIP TORQUE VALUES
INSTALLATION INSTRUCTIONS

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FENLOCK™ LOCKING ELEMENTS

DIFFERENT STYLES
VAST RANGE OF SHAFT/BORE SIZES
KEYLESS SHAFT FIXING "SHRINK DISC"

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The extended range of Fenner shaft fixing devices offers the ideal means for every application.

As well as the industrial standard Taper-Lock® bush and associated hubs/adaptors, the Fenner keyless fixing device range includes FenLock™ fixings in most formats.

- Shaft Fixings
Design Data Required
- **Shaft Dimensions**
diameter and tolerance
length
 - **Keyway details if present**
 - **Torque to be transmitted**
 - **Product hub details**
diameter
length
material (strength)
 - **Special considerations**
already taper board
bending moments on the shaft

Taper-Lock® Hubs and Adaptors

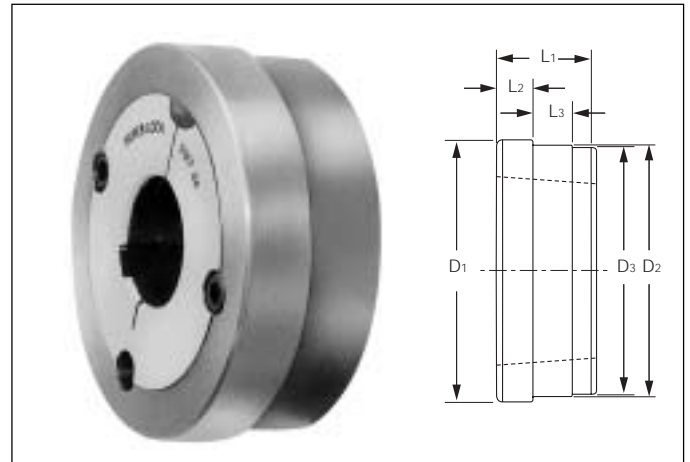
WELD-ON-HUBS

Fenner Taper-Lock® Weld-on Hubs are made of steel, grade 070M20, drilled, tapped and taper bored to receive standard Taper-Lock® bushes. The shouldered outer diameter provides a convenient means of welding hubs into fan rotors, steel pulleys, plate sprockets, impellers, agitators and many other devices which must be firmly fastened to the shaft.

Example: Part No. = **WH12**

Size	Use Bush Size	D ₁	D ₂ *	D ₃	L ₁	L ₂	L ₃
WH12	1210	70	65	64,5	25	9	10
WH16	1610	80	75	74,5	25	9	10
WH20	2012	95	90	89,5	32	12	12
WH25	2517	115	110	109,5	44	19	15
WH30	3020	145	140	139,5	50	20	15
WH35	3525	190	180	179,5	65	25	25
WH40	4030	200	190	189,5	76	32	30
WH45	4535	210	200	199,5	89	40	30
WH50	5040	230	220	219,5	102	40	35

*Bore tolerance of D₂ +0mm/-0.05mm is recommended



BOLT-ON-HUBS

Fenner Taper-Lock® Bolt-on Hubs are designed for use with the universally accepted Taper-Lock® bush.

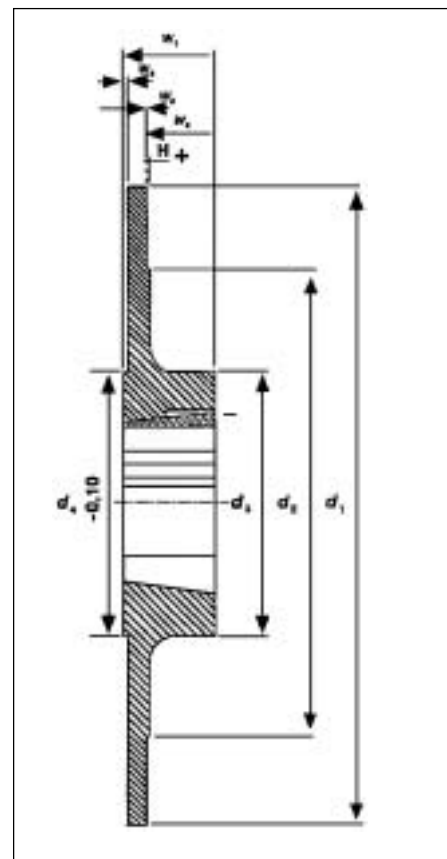
They provide a convenient means of securing fan rotors, impellers, agitators and other devices which must be fastened firmly to shafts.

Example: Part No. = **B200-16**

Size	d ₁	d ₂	d ₃	d ₄	w ₁	w ₂	w ₃	w ₄
B200-16	200	140	85	85	38	2,5	7	28,5
B300-25	300	220	125	125	45	2,5	8	34,5
B375-30	375	295	160	134	51	3,25	10	37,75
B450-30	450	360	160	160	51	3,25	10	37,75
B600-35	600	480	180	160	90	3,25	13	73,75

Size	Bush Size	Mass kg (incl. Bush)
B200-16	1615	2,7
B300-25	2517	7,1
B375-30	3020	13,4
B450-30	3020	17
B600-35	3525	38

† 'H' is merely a facing-cut to ensure satisfactory location of both heads etc. on a cast face. All dimensions in millimetres.



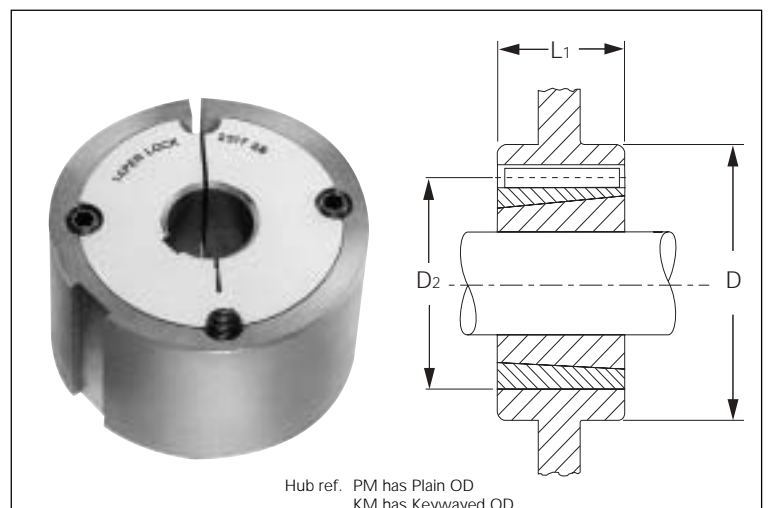
ADAPTORS

Adaptors for Fenner Taper-Lock® bushes are available for use in parallel bored components, thereby eliminating the need to drill, tap and taper-bore.

Bore tolerance of D₂ = +0.025 is recommended
+0.075

Hub ref.	L ₁	D ₂	Key Section	Hub dia. D		
				Cast Iron BS1452 GG - 20 - 25	Steel BS970Pt1 070M20	
1008PM	22	45	-	71	62	56
1008KM			5 x 5	75	67	60
1210PM	25	60	-	97	85	76
1210KM			6 x 6	103	93	85
1610PM	25	70	-	106	95	86
1610KM			10 x 8	113	102	92
2517PM	45	105	-	145	133	121
2517KM			16 x 10	151	140	127
3030PM	76	130	-	181	165	156
3030KM			20 x 12	191	175	159
3535PM	89	160	-	225	203	191
3535KM			22 x 12	235	213	200
4040PM	102	185	-	275	248	229
4040KM			24 x 12	285	257	238

All dimensions in millimetres.



Hub ref. PM has Plain OD
KM has Keyway OD

METRIC BORES AND KEYWAYS

Bore Dia.	Keyway		Keyway Depth	Product Code								
	Width	Depth		1008	1108	1210	1610	1615	2012	2517	3020	3030
9	3	1,4	-									
10	3	1,4	-	010	010							
11	4	1,8	-	011	011							
12	4	1,8	-	012	012	012						
14	5	2,3	-	014	014	014						
15	5	2,3	-	015	015	015	015	015	015			
16	5	2,3	-	016	016	016	016	016	016			
18	6	2,8	-	018	018	018	018	018	018	018		
19	6	2,8	-	019	019	019	019	019	019	019		
20	6	2,8	-	020	020	020	020	020	020	020		
22	6	2,8	-	022	022	022	022	022	022	022		
24	8	3,3	1,3	024*	024	024	024	024	024	024		
25	8	3,3	1,3	025*	025	025	025	025	025	025		
28	8	3,3	1,3		028*	028	028	028	028	028	028	
30	8	3,3	-			030	030	030	030	030	030	
32	10	3,3	--			032	032	032	032	032	032	
35	10	3,3	-				035	035	035	035	035	
38	10	3,3	-				038	038	038	038	038	038
40	12	3,3	-				040	040	040	040	040	040
42	12	3,3	2,2				042	042*	042	042	042	042
45	14	3,8	-						045	045	045	045
48	14	3,8	-						048	048	048	048
50	14	3,8	-						050	050	050	050
55	16	4,3	-							055	055	055
60	18	4,4	-							060	060	060
65	18	4,4	-								065	065
70	20	4,9	-								070	070
75	20	4,9	-								075	075

METRIC BORES AND KEYWAYS

Bore Dia.	Keyway		Shallow Keyway Depth	Product Code								
	Width	Depth		3525	3535	4030	4040	4535	4545	5040	5050	
35	10	3,3	-									
38	10	3,3	-	038	038							
40	12	3,3	-	040	040							
42	12	3,3	-	042	042	042	042					
45	14	3,8	-	045	045	045	045					
48	14	3,8	-	048	048	048	048					
50	14	3,8	-	050	050	050	050					
55	16	4,3	-	055	055	055	055					
60	18	4,4	-	060	060	060	060	060	060			
65	18	4,4	-	065	065	065	065	065	065			
70	20	4,9	-	070	070	070	070	070	070			
75	20	4,9	-	075	075	075	075	075	075	075	075	075
80	22	5,4	-	080	080	080	080	080	080	080	080	080
85	22	5,4	-	085	085	085	085	085	085	085	085	085
90	25	5,4	-	090	090	090	090	090	090	090	090	090
95	25	5,4	-	095		095	095	095	095	095	095	095
100	28	6,4	4,4	100*		100	100	100	100	100	100	100
105	28	6,4	-			105		105	105	105	105	105
110	28	6,4	-			110		110	110	110	110	110
115	32	7,4	5,4			115*		115		115	115	115
120	32	7,4	-					120		120	120	120
125	32	7,4	-					125		125	125	125

Dimensions in millimetres.

Keyways are British Standard Metric BS 4235: Part 1: 1972 DIN 6885 and conform to ISO recommendations with the exception of those marked* which are shallower.

Where a key is to be used it should be parallel and side fitting with top clearance. Depth of keyway is measured at CENTRE.

Bold italic type indicates bushes made of ductile material.

Taper-Lock® Inch Bushes

INCH BORES AND KEYWAYS

Bore Dia.	Keyway		Shallow Keyway Depth	Product Code								
	Width	Depth		1008	1108	1210	1610	1615	2012	2517	3020	3030
0,375	0,125	0,06	-									
0,500	0,125	0,06	-	008	008							
0,625	0,187	0,09	-	010	010		010	010				
0,750	0,187	0,09	-	012	012	012	012	012				
0,875	0,250	0,12	-	014	014	014	014	014	014	014		
1,000	0,250	0,12	0,052	100*	100	100	100	100	100	100		
1,125	0,312	0,11	0,064		102*	102	102	102	102	102		
1,250	0,312	0,11	-			104	104	104	104	104		
1,375	0,375	0,11	-				106	106	106	106	106	106
1,500	0,375	0,11	-				108	108	108	108	108	108
1,625	0,437	0,13	0,103				110	110*	110	110	110	110
1,750	0,437	0,13	-						112	112	112	112
1,875	0,500	0,13	-						114	114	114	114
2,000	0,500	0,13	-						200	200	200	200
2,125	0,625	0,18	-							202	202	202
2,250	0,625	0,18	-							204	204	204
2,375	0,625	0,18	-							206	206	206
2,500	0,625	0,18	-							208	208	208
2,625	0,750	0,21	-								210	210
2,750	0,750	0,21	-								212	212
2,875	0,750	0,21	-								214	214
3,000	0,750	0,21	-								300	300

INCH BORES AND KEYWAYS

Bore Dia.	Keyway		Shallow Keyway Depth	Product Code								
	Width	Depth		3525	3535	4030	4040	4535	4545	5040	5050	
1,500	0,375	0,11	-									
1,625	0,437	0,13	-	110	110							
1,750	0,437	0,13	-	112	112							
1,875	0,500	0,13	-	114	114	114	114					
2,000	0,500	0,13	-	200	200	200	200					
2,125	0,625	0,18	-	202	202	202	202					
2,250	0,625	0,18	-	204	204	204	204					
2,375	0,625	0,18	-	206	206	206	206	206	206			
2,500	0,625	0,18	-	208	208	208	208	208	208			
2,625	0,750	0,21	-	210	210	210	210	210	210			
2,750	0,750	0,21	-	212	212	212	212	212	212			
2,875	0,750	0,21	-	214	214	214	214	214	214	214	214	214
3,000	0,750	0,21	-	300	300	300	300	300	300	300	300	300
3,125	0,875	0,26	-	302	302	302	302	302	302	302	302	302
3,250	0,875	0,26	-	304	304	304	304	304	304	304	304	304
3,375	0,875	0,26	-	306	306	306	306	306	306	306	306	306
3,500	0,875	0,26	-	308	308	308	308	308	308	308	308	308
3,750	1,000	0,32	0,245	312*		312	312	312	312	312	312	312
4,000	1,000	0,32	0,155	400*		400	400	400	400	400	400	400
4,250	1,250	0,37	-			404		404	404	404	404	404
4,500	1,250	0,37	0,255			408*		408	408	408	408	408
4,750	1,250	0,37	-					412		412	412	412
5,000	1,250	0,37	0,258					500*		500	500	500

Dimensions in inches.

All Keyways are parallel and to British Standard 46: Part 1: 1958, with the exception of those marked* which are shallower.

Where a key is to be used it should be side fitting with top clearance. Depth of keyway is measured at CENTRE.

Bold italic type indicates bushes made of ductile material.

Minimum Diameters of Taper Bored Hubs

The following table shows the recommended minimum diameter in mm for bespoke component hubs that are to be drilled, tapped and taper bored for use with Taper-Lock® bushes. The table differentiates between grey iron and ductile materials of various minimum tensile strength grades (in N/mm² or MN/m² units, which are numerically equal).

All standard Fenner Taper-Lock® products are tested to ensure that they are capable of safely containing the radial and circumferential hub stresses generated by the wedging mechanism which makes Taper-Lock® the equivalent of a shrink-on fit. For Taper-Lock® hub machining details, consult Fenner Power Transmission Distributor.

Taper-Lock® Bush	Minimum Hub Diameters (mm) for Various Materials			
	Tensile Strength N/mm ²			
	Cast Iron 180	Cast Iron 250	Steel 420	Steel 600
1008	62	54	51	47
1108	64	57	54	50
1210	104	86	78	69
1610	109	92	85	78
1615	90	81	77	73
2012	121	106	99	92
2517	130	119	113	108
3020	160	146	140	132
3030	144	136	132	127
3525	211	191	178	167
3535	191	176	168	160
4030	224	207	197	186
4040	209	195	188	180
4535	223	212	205	198
4545	215	205	200	194
5040	240	229	223	216
5050	233	223	219	213

Average Slip Torques for Taper Lock Fixing (Without key)

The following table shows empirically derived average slip torque values in Nm for each basic Taper-Lock® bush size with a variety of common metric bore diameters. The values assume that the assembly uses a Fenner Taper-Lock® bush fitted, in accordance with the instructions supplied with every bush, to a hub prepared to the Fenner specification. Slip will tend to occur at the bush/shaft interface, at the prescribed torque, unless a key is fitted. With a key, the slip tendency transfers to the bush/hub interface at a greater torque value related to the ratio of bush outer dia. to bore dia.. Consult Fenner Power Transmission Distributor for specific values.

Formula to calculate the slip torque if a key is used: $\frac{\text{Large OD of Bush}}{\text{Shaft Size}} \times \text{average slip torque value.}$

Bush	Bore (mm)	Average Slip Torque (Nm)	Bush	Bore (mm)	Average Slip Torque (Nm)
1008	12	29	3020 3030	38	520
	19	51		48	730
	24	66		55	890
1108	12	28	3525* 3535	60	970
	19	49		75	1300
	24	64		42	1000
1210	28	79	4030* 4040	60	1580
	16	82		75	2150
	19	105		90	2600
	24	142		100*	3075
1610 1615	32	210	4535* 4545	48	1700
	19	98		60	2300
	24	135		75	3150
	38	240		100	4400
2012	42	265	5040 5050	115*	5150
	24	165		75	3950
	38	320		100	5650
	42	340		110	6300
	48	400		125*	6625
2517	50	420			
	24	220			
	38	380			
	42	430			
	48	510			
	55	600			
	60	670			

Large bores marked* are only available in bush sizes marked*

Taper-Lock® Installation Instructions

TO INSTALL

1. After ensuring that the mating tapered surfaces, bore and shaft are completely clean and free from oil or dirt, insert bush in hub so that holes line up.
2. Sparingly oil thread and point of grub screws, or thread and under head of cap screws. Place screws loosely in holes threaded in hub, shown thus ⊙ in diagram.
3. If a key is to be fitted place it in the shaft keyway before fitting the bush. It is essential that it is a parallel key and side fitting only and has **TOP CLEARANCE**.
4. Clean shaft and fit hub to shaft as one unit and locate in position desired, remembering that bush will nip the shaft first and then hub will be slightly drawn on to the brush.
5. Using a hexagon wrench tighten screws gradually and alternately to torque shown in table below.
6. **Hammer against large-end of bush**, using a block or sleeve to prevent damage. (This will ensure that the bush is seated squarely in the bore.) Screws will now turn a little more. Repeat this alternate hammering and screw tightening once or twice to achieve maximum grip on the shaft.
7. After drive has been running under load for a short time stop and check tightness of screws.
8. Fill empty holes with grease to exclude dirt.



INSERT BUSH



INSERT SCREWS and LOCATE ON SHAFT



TIGHTEN SCREWS FINGER TIGHT



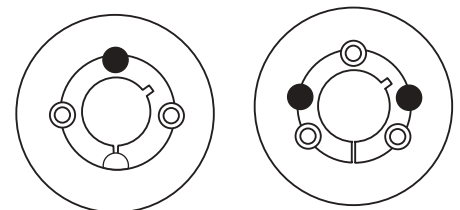
TIGHTEN SCREWS ALTERNATELY



REMOVING A TAPER-LOCK® BUSH

TO REMOVE

1. Slacken all screws by several turns, remove one or two according to number of removal holes shown thus ● in diagram. Insert screws into removal holes after oiling thread and under head of cap screws.
2. Tighten screws alternately until bush is loosened in hub and assembly is free on the shaft.
3. Remove assembly from shaft.



REMOVAL HOLES ●

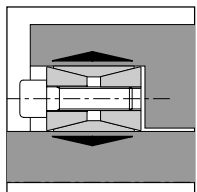
Bush size	1008	1108	1210	1610	1615	2012	2517	3020	3030	3525	3535	4030	4040	4535	4545	5040	5050
Screw tightening torque (Nm)	5,6	5,6	20	20	20	30	50	90	90	115	115	170	170	190	190	270	270
qty	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
Screw details	size (BSW)	1/4"	1/4"	3/8"	3/8"	3/8"	7/16"	1/2"	5/8"	5/8"	1/2"	1/2"	5/8"	5/8"	3/4"	3/4"	7/8"
	Hex, socket size (mm)	3	3	5	5	5	6	6	8	8	10	10	12	12	14	14	14
Large end dia. (mm)	35,0	38,0	47,5	57,0	57,0	70,0	85,5	108	108	127	127	146	146	162	162	178	178
Bush length (mm)	22,3	22,3	25,4	25,4	38,1	31,8	44,5	50,8	76,2	63,5	89,0	76,2	102	89,0	114	102	127
Approx mass (kg)	0,1	0,1	0,2	0,3	0,5	0,7	1,5	2,7	3,6	3,8	5,0	5,6	7,7	7,5	10,0	11,1	14,0

FenLock™ locking elements are precision made in the finest steel materials to provide a wide, versatile range of keyless shaft/hub fixing assemblies.

They offer
 Simple installation/disassembly
 Resistance to alternating torques
 Increased shaft strength
 High torque transmission capacity

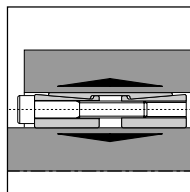
No backlash
 Axial and angular adjustment capability
 No fretting corrosion
 Simple selection

THE FENLOCK™ PRODUCT RANGE



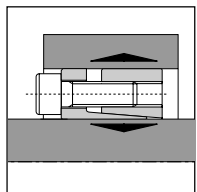
FLK 200*

Medium/high torque
 Non self centering
 Available for shafts 20-900 mm dia.
 Max allowable surface finish Rt max 16µm
 Tolerances h11 shaft - H11 hub
 No axial movement



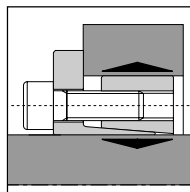
FLK 450/400

Very high torque
 Self centering
 Available for shafts 25-400 mm dia.
 Max allowable surface finish Rt max 16µm
 Tolerances h8 shaft - H8 hub.



FLK 132*

Less screws - quicker installation
 Self centering Medium/high torque
 Max allowable surface finish Rt max 16µm
 Slight axial movement hub/shaft
 Available for shafts 20-200 mm dia
 Tolerances h8 shaft - H8 hub.



FLK 133*

As FLK 132 with larger dia. location collar
 Less screws - quicker installation
 Medium/high torque Self centering
 No axial movement hub/shaft
 Available for shafts 20-200 mm dia
 Max allowable surface finish Rt max 16µm
 Tolerances h8 shaft - H8 hub.

FENLOCK™ SELECTION

- 1) Determine the maximum torque (Nm) to be transmitted, including fluctuations and shock loads, and any axial forces (kN) to be withstood.
- 2) Use the features table above to help determine the type of FenLock™ device to use.
- 3) Use the tabulated data on the following pages to establish torque (Mt) and axial load capacity (F) of the chosen unit on the shaft size being used, and that they exceed applicational requirements. **Note:** Maximum torque and axial force values are mutually exclusive. For combined torque and axial force applications, consult your Fenner Power Transmission Distributor.
- 4) Check dimensional suitability, self centering capability and ease of installation/disassembly.
- 5) For hub strength calculations or more detailed selection advice - consult your Fenner representative.

INSTALLATION

- 1) Ensure cleanliness of hub and shaft contact surfaces.
- 2) Screw threads and conical surfaces should be lightly oiled.
- 3) Tighten fixing screws gradually, in diagonal sequence, up to torque Ms (Nm).
- 4) For more detailed information - consult your Fenner Power Transmission Distributor.

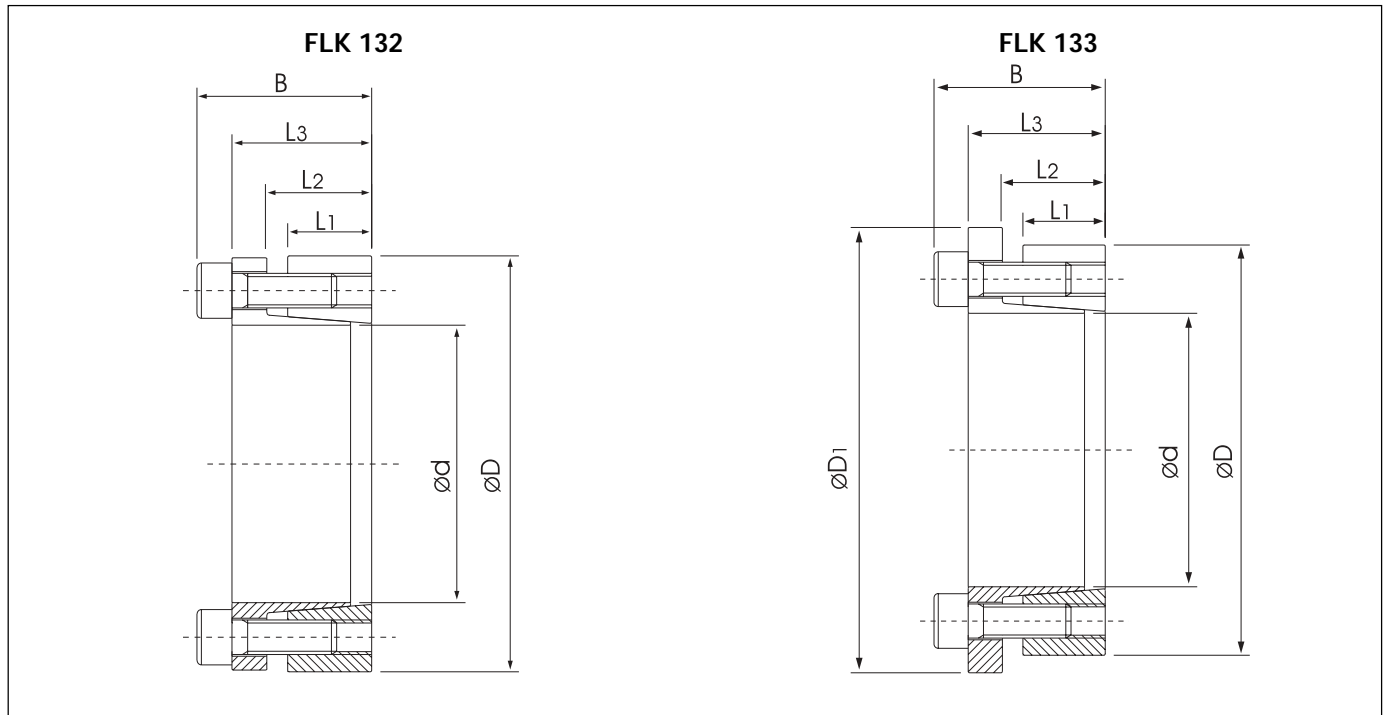
TORQUE

- 1) The kilowatt (kW) is the most common unit of mechanical power, i.e. the rate of doing work. Torque is the turning movement of twisting effort and is expressed in newton metre (Nm).

$$\text{Nm} = \frac{\text{kW} \times 9\,550}{\text{r/min}}$$

$$\text{kW} = \frac{\text{Nm} \times \text{r/min}}{9\,550}$$

FenLock™ locking elements type FLK 132 + FLK 133 self-centering



Example: Part No. = FLK 20 x 47

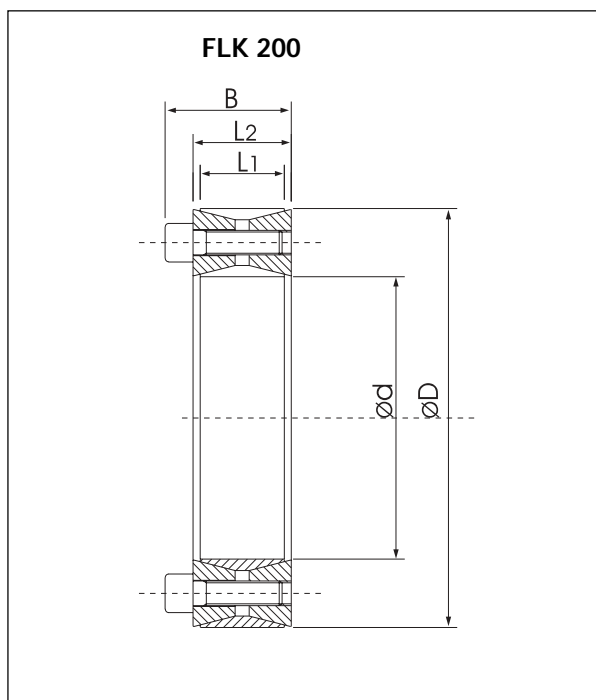
		FLK 132							FLK 133					
d x D	L1	L2	L3	B	FLK 133 Only D1	Tightening Screws		Torque Mt Nm	Axial Thrust F ass. kN	Hub Stress Pn N/mm²	Torque Mt Nm	Axial Thrust F ass. kN	Hub Stress Pn N/mm²	
						Grade 12.9	Tightening torque Ms Nm							
mm	mm	mm	mm	mm	mm	No. x type	FLK 132	FLK 133						
20 x 47	17	22	28	34	54	5 x M6	14	17	380	38	125	280	28	95
22 x 47	17	22	28	34	54	5 x M6	14	17	410	38	125	300	28	95
24 x 50	17	22	28	34	57	5 x M6	14	17	450	38	120	330	28	90
25 x 50	17	22	28	34	57	6 x M6	14	17	570	46	140	420	34	105
28 x 55	17	22	28	34	62	6 x M6	14	17	630	46	130	470	34	95
30 x 55	17	22	28	34	62	6 x M6	14	17	660	46	130	500	34	95
32 x 60	17	22	28	34	67	8 x M6	14	17	970	60	155	720	45	115
35 x 60	17	22	28	34	67	8 x M6	14	17	1060	60	155	790	45	115
38 x 65	17	22	28	34	72	8 x M6	14	17	1150	60	145	850	45	105
40 x 65	17	22	28	34	72	8 x M6	14	17	1210	60	145	900	45	105
42 x 75	20	25	33	41	82	7 x M8	35	41	2050	98	170	1530	73	125
45 x 75	20	25	33	41	82	7 x M8	35	41	2200	98	170	1650	73	125
48 x 80	20	25	33	41	87	7 x M8	35	41	2350	98	160	1760	73	120
50 x 80	20	25	33	41	87	7 x M8	35	41	2450	98	160	1830	73	120
55 x 85	20	25	33	41	92	8 x M8	35	41	3080	112	175	2300	83	130
60 x 90	20	25	33	41	97	8 x M8	35	41	3360	112	165	2510	83	125
65 x 95	20	25	33	41	102	9 x M8	35	41	4090	126	175	3060	94	130
70 x 110	24	30	40	50	117	8 x M10	70	83	6300	179	180	4670	133	135
75 x 115	24	30	40	50	122	8 x M10	70	83	6700	179	170	5000	133	125
80 x 120	24	30	40	50	127	8 x M10	70	83	7150	179	170	5300	133	125
85 x 125	24	30	40	50	132	9 x M10	70	83	8500	200	180	6300	148	135
90 x 130	24	30	40	50	137	9 x M10	70	83	9100	200	170	6750	148	130
95 x 135	24	30	40	50	142	10 x M10	70	83	10600	224	180	7900	166	135
100 x 145	26	32	44	56	152	8 x M12	125	145	13400	268	190	9700	194	140
110 x 155	26	32	44	56	162	8 x M12	125	145	14600	268	180	10600	194	130
120 x 165	26	32	44	56	172	9 x M12	125	145	17900	298	180	13000	216	135
130 x 180	34	40	54	66	187	12 x M12	125	145	26000	400	170	18900	290	125
140 x 190	34	40	54	68	197	9 x M14	190	230	27000	384	150	20500	290	120
150 x 200	34	40	54	68	207	10 x M14	190	230	33000	440	170	25000	333	130
160 x 210	34	40	54	68	217	11 x M14	190	230	38000	479	170	29000	362	135
170 x 225	44	50	64	78	232	12 x M14	190	230	45000	530	130	34000	400	105
180 x 235	44	50	64	78	242	12 x M14	190	230	47000	530	130	36000	400	105
190 x 250	44	50	64	78	257	15 x M14	190	230	62900	660	150	47500	500	120
200 x 260	44	50	64	78	267	15 x M14	190	230	66000	660	150	50000	500	115

R = FLK 132 G = FLK 133

NOTE: It is possible to reduce the screw tightening torque down to 60% of the values indicated in above table; as a result Mt & F ass. are reduced proportionally.

FenLock™ Locking Element Dimensions

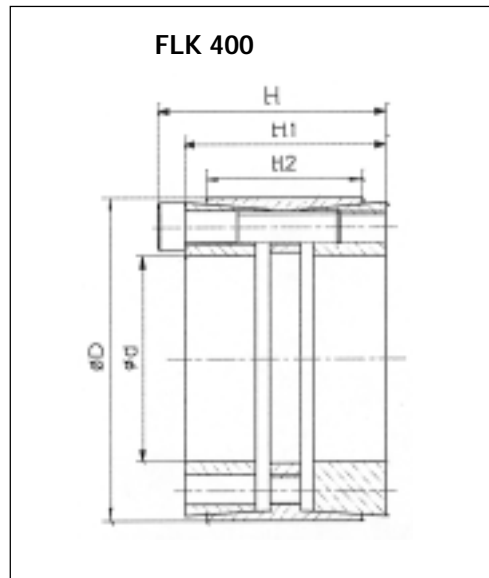
FenLock™ locking elements type FLK 200 non self-centering



d x D mm	L1 mm	L2 mm	B mm	Torque			Tightening screws	
				Mt Nm	Axial Thrust F ass. kN	Hub Stress Pn N/mm ²	Grade 12.9 No. x type	Tightening Torque Ms Nm
20 x 47	17	20	27,5	280	29	95	8 x M6	15
22 x 47	17	20	27,5	310	29	95	8 x M6	15
24 x 50	17	20	27,5	370	32	100	8 x M6	15
25 x 50	17	20	27,5	400	32	100	8 x M6	15
28 x 55	17	20	27,5	500	36	100	10 x M6	15
30 x 55	17	20	27,5	530	36	100	10 x M6	15
32 x 60	17	20	27,5	680	42	110	12 x M6	15
35 x 60	17	20	27,5	750	43	110	12 x M6	15
38 x 65	17	20	27,5	930	49	115	14 x M6	15
40 x 65	17	20	27,5	980	49	115	14 x M6	15
42 x 75	20	24	33,5	1580	75	130	12 x M8	37
45 x 75	20	24	33,5	1700	76	130	12 x M8	37
48 x 80	20	24	33,5	1790	74	120	12 x M8	37
50 x 80	20	24	33,5	1870	75	120	12 x M8	37
55 x 85	20	24	33,5	2390	88	135	14 x M8	37
60 x 90	20	24	33,5	2610	88	125	14 x M8	37
65 x 95	20	24	33,5	3210	98	135	16 x M8	37
70 x 110	24	28	39,5	4600	132	130	14 x M10	70
75 x 115	24	28	39,5	4900	131	125	14 x M10	70
80 x 120	24	28	39,5	5200	131	120	14 x M10	70
85 x 125	24	28	39,5	6300	148	130	15 x M10	70
90 x 130	24	28	39,5	6600	147	125	16 x M10	70
95 x 135	24	28	39,5	7900	167	135	18 x M10	70
100 x 145	26	33	47	9750	195	135	14 x M12	127
110 x 155	26	33	47	10650	194	125	14 x M12	127
120 x 165	26	33	47	13300	221	135	16 x M12	127
130 x 180	34	38	52	17850	276	115	20 x M12	127
140 x 190	34	38	52	21200	302	125	22 x M12	127
150 x 200	34	38	52	24500	329	125	24 x M12	127
160 x 210	34	38	52	28400	355	130	26 x M12	127
170 x 225	38	44	60	33600	396	120	22 x M14	195
180 x 235	38	44	60	38700	431	130	24 x M14	195
190 x 250	46	52	68	44700	502	120	28 x M14	195
200 x 260	46	52	68	53500	538	120	30 x M14	195
220 x 285	50	56	74	68500	630	120	26 x M16	300
240 x 305	50	56	74	86000	717	130	30 x M16	300
260 x 325	50	56	74	105000	810	135	34 x M16	300
280 x 355	60	66	86,5	128500	920	120	32 x M18	410
300 x 375	60	66	86,5	153600	1025	125	36 x M18	410

FenLock™ Locking Element Dimensions

FenLock™ locking elements type FLK 400 self-centering



Dimensions					Transmission		Contact pressure		Locking Screws DIN912-12.9		
d mm	D mm	H mm	H1 mm	H2 mm	Axial Force	Torque	Shaft	Hub	Quantity	Size	Tightening Torque
					Ft kN	Mt Nm	P N/mm ²	P1 N/mm ²			Ts Nm
25	55	46	40	32	59	743	292	100	6	M6X35	17
28	55	46	40	32	59	832	261	100	6	M6X35	17
30	55	46	40	32	59	891	243	100	6	M6X35	17
35	60	60	54	44	69	1211	172	77	7	M6X45	17
38	75	62	54	44	125	2372	285	112	7	M6X50	41
40	75	62	54	44	125	2497	271	112	7	M6X50	41
42	75	62	54	44	125	2622	258	112	7	M6X50	41
45	75	62	54	44	125	2809	241	112	7	M6X50	41
48	80	62	64	56	143	3427	199	94	8	M6X55	41
50	80	72	64	56	143	3569	191	94	8	M6X55	41
55	85	72	64	56	161	4416	196	99	9	M6X55	41
60	90	72	64	56	178	5352	199	104	10	M6X55	41
65	95	72	64	56	178	5799	184	99	10	M6X55	41
70	110	88	78	70	289	10123	218	111	10	M6X60	83
75	115	88	78	70	289	10846	203	106	10	M6X60	83
80	120	88	78	70	318	12727	209	112	11	M6X60	83
85	125	88	78	70	347	14752	215	117	12	M6X60	83
90	130	88	78	70	347	15620	203	112	12	M6X60	83
95	135	88	78	70	347	13488	192	108	12	M6X60	83
100	145	112	100	90	463	23150	195	105	11	M6X80	145
110	155	112	100	90	505	27781	193	107	12	M6X80	145
120	165	112	100	90	589	35361	207	117	14	M6X80	145
130	180	130	116	104	687	44633	185	108	12	M6X90	230
140	190	130	116	104	801	56073	201	120	14	M6X90	230
150	200	130	116	104	858	64371	201	122	15	M6X90	230
160	210	130	116	104	916	73241	201	124	16	M6X90	230
170	225	164	148	134	1098	93306	190	107	14	M6X110	360
180	235	164	148	134	1176	105851	193	110	15	M6X110	360
190	250	164	148	134	1255	119180	195	110	16	M6X110	360

SHAFT
FIXINGS

FenLock™ Locking Element Dimensions

To Calculate the Minimum Hub Diameter (Dm).

FenLock™ locking elements create a surface pressure Pn between the clamping outer ring and hub bore when fitted. Shaft values are higher than the hub stresses but generally the hub stress level is the critical factor as it must be below the yield stress of the material.

The minimum hub diameter **Dm** is calculated using the following formula

$$Dm \geq (D \cdot K)$$

where

Dm = Minimum hub diameter

D = Outside diameter of locking element

K = Coefficient K derived from the table below

Use **Pn** from product tables factor C (see below)

Based on securing a cast iron 50mm wide pulley to a steel shaft using a FenLock™ 200 80 x 120.

Pulley Material = GG25 (Page 293)

C = 0,8 as assembly is as per Type 2 Application

Pn = 120 N/mm² (Page 291)

K = 1,81 (Page 293)

$$Dm \geq (D \cdot K)$$

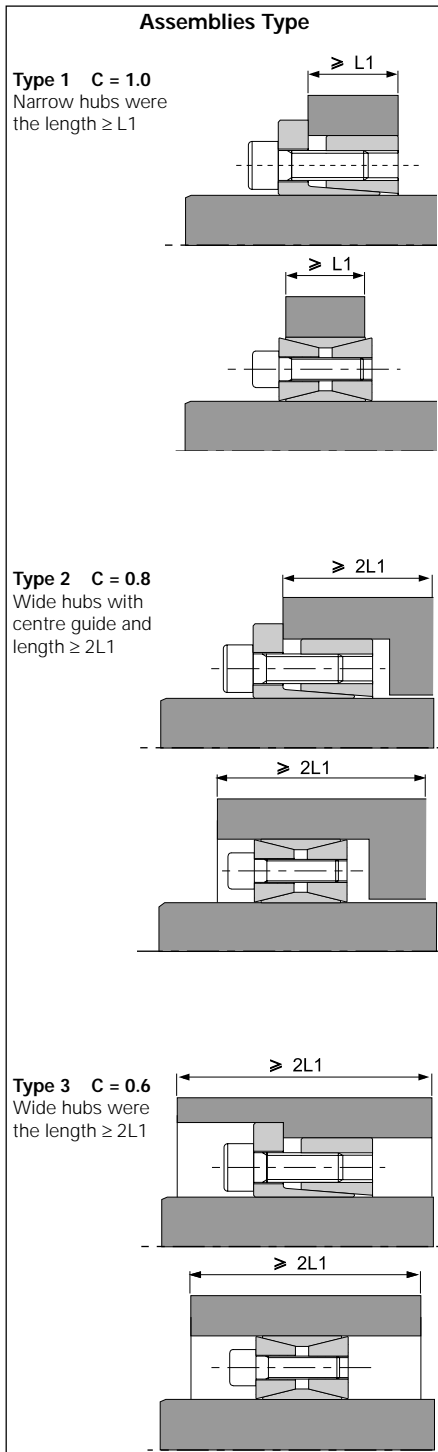
$$Dm \geq (120 \times 1,81)$$

$$Dm \geq 217,2mm$$

Therefore, the minimum hub diameter that can be used is 217,2mm.

Example

FACTOR C



COEFFICIENT K

Pressure generated on the hub	Pn N/mm ²	Application type C	Yield point N/mm ²										
			150	180	200	220	250	270	300	350	400	450	600
			Material type										
			GG20	GG25 GS38	GG30 GTS35	GS45 ST37-2	GGG40 GS52	ST50-2 C35	GGG50 GS60 ST60-2	GGG60 GS62 ST70-2	GGG70 GS70 C60		
60	C=0,6	1,28	1,25	1,20	1,18	1,15	1,14	1,12	1,10	1,09	1,08	1,06	
	C=0,8	1,39	1,30	1,24	1,23	1,22	1,20	1,18	1,15	1,12	1,11	1,08	
	C=1	1,52	1,42	1,36	1,32	1,28	1,25	1,22	1,18	1,16	1,14	1,10	
65	C=0,6	1,30	1,25	1,22	1,20	1,18	1,15	1,13	1,11	1,10	1,09	1,07	
	C=0,8	1,44	1,35	1,30	1,28	1,24	1,22	1,20	1,16	1,14	1,12	1,09	
	C=1	1,60	1,45	1,40	1,35	1,30	1,28	1,24	1,20	1,18	1,16	1,12	
70	C=0,6	1,34	1,26	1,24	1,22	1,18	1,16	1,15	1,12	1,11	1,10	1,07	
	C=0,8	1,48	1,38	1,34	1,30	1,25	1,23	1,20	1,18	1,15	1,13	1,10	
	C=1	1,65	1,50	1,45	1,40	1,34	1,30	1,26	1,22	1,20	1,17	1,13	
75	C=0,6	1,30	1,28	1,25	1,23	1,20	1,18	1,16	1,14	1,12	1,11	1,08	
	C=0,8	1,52	1,42	1,36	1,32	1,28	1,25	1,22	1,18	1,16	1,14	1,11	
	C=1	1,74	1,55	1,48	1,42	1,36	1,33	1,30	1,25	1,20	1,18	1,13	
80	C=0,6	1,39	1,31	1,28	1,25	1,21	1,20	1,18	1,15	1,13	1,11	1,08	
	C=0,8	1,58	1,45	1,39	1,35	1,30	1,27	1,24	1,20	1,18	1,15	1,11	
	C=1	1,81	1,61	1,53	1,46	1,39	1,36	1,31	1,26	1,22	1,20	1,14	
85	C=0,6	1,42	1,34	1,30	1,27	1,23	1,21	1,19	1,16	1,14	1,12	1,09	
	C=0,8	1,63	1,49	1,42	1,38	1,32	1,29	1,26	1,22	1,19	1,16	1,12	
	C=1	1,90	1,67	1,57	1,50	1,42	1,39	1,34	1,28	1,24	1,21	1,15	
90	C=0,6	1,46	1,36	1,32	1,28	1,25	1,22	1,20	1,17	1,15	1,13	1,09	
	C=0,8	1,69	1,53	1,46	1,40	1,34	1,31	1,28	1,23	1,20	1,18	1,13	
	C=1	2,00	1,73	1,62	1,54	1,46	1,41	1,36	1,30	1,26	1,22	1,16	
95	C=0,6	1,49	1,39	1,34	1,30	1,26	1,24	1,21	1,18	1,15	1,14	1,10	
	C=0,8	1,75	1,57	1,49	1,43	1,37	1,34	1,30	1,25	1,21	1,19	1,14	
	C=1	2,11	1,80	1,68	1,59	1,49	1,44	1,39	1,32	1,27	1,24	1,17	
100	C=0,6	1,53	1,41	1,36	1,32	1,28	1,25	1,22	1,19	1,16	1,14	1,11	
	C=0,8	1,81	1,61	1,53	1,46	1,39	1,36	1,31	1,26	1,22	1,20	1,14	
	C=1	2,24	1,87	1,73	1,63	1,53	1,48	1,41	1,34	1,29	1,25	1,18	
105	C=0,6	1,56	1,44	1,39	1,34	1,29	1,27	1,24	1,20	1,17	1,15	1,11	
	C=0,8	1,88	1,66	1,56	1,50	1,42	1,38	1,33	1,28	1,24	1,21	1,15	
	C=1	2,38	1,95	1,79	1,68	1,56	1,51	1,44	1,36	1,31	1,27	1,19	
110	C=0,6	1,60	1,47	1,41	1,36	1,31	1,28	1,25	1,21	1,18	1,16	1,12	
	C=0,8	1,96	1,71	1,60	1,53	1,44	1,41	1,35	1,29	1,25	1,22	1,16	
	C=1	2,55	2,04	1,86	1,73	1,60	1,54	1,47	1,38	1,33	1,28	1,20	
115	C=0,6	1,64	1,50	1,43	1,36	1,33	1,30	1,26	1,22	1,19	1,17	1,12	
	C=0,8	2,04	1,76	1,64	1,56	1,47	1,43	1,37	1,31	1,26	1,23	1,17	
	C=1	2,75	2,13	1,93	1,79	1,64	1,58	1,50	1,41	1,34	1,30	1,21	
120	C=0,6	1,69	1,53	1,46	1,40	1,34	1,31	1,28	1,23	1,20	1,18	1,13	
	C=0,8	2,13	1,81	1,69	1,60	1,50	1,45	1,39	1,33	1,28	1,24	1,18	
	C=1	3,00	2,24	2,00	1,84	1,69	1,61	1,53	1,43	1,36	1,31	1,22	
125	C=0,6	1,73	1,56	1,48	1,43	1,36	1,33	1,29	1,24	1,21	1,18	1,13	
	C=0,8	2,24	1,87	1,73	1,63	1,53	1,48	1,41	1,34	1,29	1,25	1,18	
	C=1	3,32	2,35	2,08	1,91	1,73	1,65	1,56	1,45	1,38	1,33	1,24	
130	C=0,6	1,78	1,59	1,51	1,45	1,38	1,35	1,30	1,25	1,22	1,19	1,14	
	C=0,8	2,35	1,93	1,78	1,67	1,56	1,50	1,44	1,36	1,30	1,27	1,19	
	C=1	3,74	2,49	2,17	1,97	1,78	1,69	1,59	1,48	1,40	1,35	1,25	
135	C=0,6	1,83	1,62	1,54	1,47	1,40	1,36	1,32	1,27	1,23	1,20	1,15	
	C=0,8	2,48	2,00	1,83	1,71	1,59	1,53	1,46	1,38	1,32	1,28	1,20	
	C=1	4,36	2,65	2,27	2,04	1,83	1,73	1,62	1,50	1,42	1,36	1,26	
140	C=0,6	1,88	1,66	1,56	1,50	1,42	1,38	1,33	1,28	1,24	1,21	1,15	
	C=0,8	2,63	2,07	1,88	1,75	1,62	1,55	1,48	1,39	1,33	1,29	1,21	
	C=1	5,39	2,83	2,38	2,12	1,88	1,78	1,66	1,53	1,44	1,38	1,27	
145	C=0,6	1,94	1,69	1,59	1,52	1,44	1,40	1,35	1,29	1,25	1,22	1,16	
	C=0,8	2,80	2,15	1,94	1,80	1,65	1,58	1,50	1,41	1,35	1,30	1,22	
	C=1	7,68	3,05	2,50	2,21	1,94	1,82	1,69	1,55	1,46	1,40	1,28	
150	C=0,6	2,00	1,73	1,62	1,54	1,46	1,41	1,36	1,30	1,26	1,23	1,16	
	C=0,8	3,00	2,24	2,00	1,84	1,69	1,61	1,53	1,43	1,36	1,31	1,23	
	C=1	—	3,32	2,65	2,30	2,00	1,87	1,73	1,58	1,48	1,41	1,29	
155	C=0,6	2,06	1,77	1,65	1,57	1,48	1,43	1,38	1,31	1,27	1,24	1,17	
	C=0,8	3,25	2,33	2,06	1,89	1,72	1,65	1,55	1,45	1,38	1,33	1,23	
	C=1	—	3,66	2,80	2,40	2,06	1,92	1,77	1,61	1,51	1,43	1,30	
160	C=0,6	2,13	1,81	1,69	1,60	1,50	1,45	1,39	1,33	1,28	1,24	1,18	
	C=0,8	3,55	2,43	2,13	1,94	1,76	1,67	1,58	1,47	1,39	1,34	1,24	
	C=1	—	4,12	3,00	2,52	2,13	1,98	1,81	1,64	1,53	1,45	1,31	
165	C=0,6	2,21	1,86	1,72	1,62	1,52	1,47	1,41	1,34	1,29	1,25	1,18	
	C=0,8	3,96	2,55	2,21	2,00	1,80	1,71	1,60	1,49	1,41	1,35	1,25	
	C=1	—	4,80	3,23	2,65	2,21	2,04	1,86	1,67	1,55	1,47	1,33	

FenLock™ Locking Element

FenLock™, transmits more torque, for a given shaft size, than other shaft fixing devices.



A single FenLock™ locking element can transmit up to 3 times the torque of other quick-fit shaft fixing devices, without a key!

This new range offers high torque/size ratios, zero backlash, and quick adjustment. With our comprehensive range, all applications can be solved.

By avoiding the use of keys and keyways, simple installation/disassembly, increased shaft strength, zero backlash, and easy axial and angular positioning are achieved.

The exceptional torque and axial thrust capacity, along with resistance to alternating torque and eradication of fretting corrosion extends drive life.

Fits shafts sizes from 6mm to 900mm

Transmits torque up to 1,65 MNm

Automatic self-centering types

Zero axial movement ranges

Includes low surface pressure design (Min. hub diameters)

"Shrink Disc" elements included in the range