Chainflex Couplings

RENOLD
Superior Coupling Technology

www.renold.com

RENOLD

Strength through Service

Renold Gears has been manufacturing high quality, high specification gear units for over 100 years and has always been at the leading edge of gear technology with innovative products and power transmission solutions.

Interchangeability

Many of the products from Renold Gears are dimensionally interchangeable with other manufacturers gear units, allowing a trouble free replacement of gearboxes, in most cases upgrading the capacity through state of the art technology and materials.

Custom Made

Renold Gears is unique in it's ability to offer custom made products designed to meet customers exacting requirements without compromise on availability and cost. From complete package solutions to individual precision replacement gears, all can be tailor made to meet specific applicational requirements.

Available

The most popular ranges of gearboxes are available from local distribution stock, backed up by extensive stocks from our manufacturing plant in the UK.

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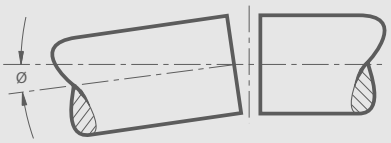
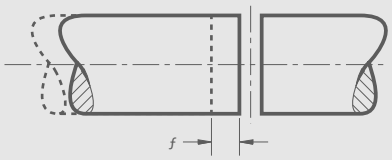
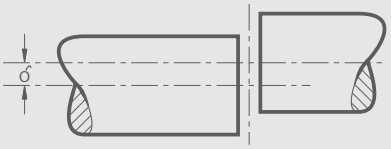
Coupling Selection Guide



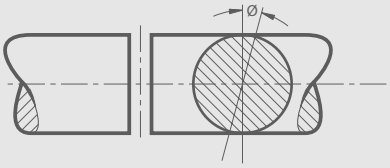
Angular



End float



Parallel offset



Torsional flexibility

Flexible Couplings should be used to accommodate any combination of misalignment conditions described below.

At installation all couplings should be aligned as near to perfect as possible.

1. Angular
Angular misalignment is present when the shaft axes are inclined one to the other. Its magnitude can be measured at the coupling faces.

2. Parallel Offset
Axial misalignment is present when the axes of the driving and driven shafts are parallel but laterally displaced.

3. End float (axial)
End float is the ability to accommodate a relative axial displacement of the connected shafts; achieved by sliding members or flexing of resilient components.

4. Torsional flexibility
Torsional flexibility is a design feature necessary to permit shock and impulsive loadings to be suitably dampened. It is achieved by the provision of a flexible medium such as rubber, springs, etc., between the two halves of the coupling.

Selection
In order to select the correct type and size of coupling, the following basic information should be known:

Power to be transmitted
(a) Normal.
(b) Maximum.
(c) Whether continuous or intermittent.

Characteristics of the drive
(a) Type of prime mover and associated equipment.
(b) Degree of impulsiveness of driven load.

Speed in revolutions per minute
(a) At which normal power is transmitted.
(b) At which maximum power is transmitted.
(c) Maximum speed.

Dimensions of shafts to be connected
(a) Actual diameter.
(b) Length of shaft extension.
(c) Full keyway particulars.

Selection
When the input drive is not steady (i.e. not from an electric motor), and/or the driven load is impulsive, the actual power is multiplied by a Service Factor from the Table 2 (page 13).

Selection Procedure
1. Nominal power in kW to be transmitted = K.

2. Select appropriate load classification from Table 1, denoted as either S, M or H.

3. From Table 2, establish Service Factor(s) to be applied, taking into account hours of operation/day and prime mover = fD.

4. From Table 3 select factor for the required frequency of starts/hr = fS.

5. Selection Power Ks = K x fD x fS

6. Equivalent power at 100 RPM = $\frac{Ks \times 100}{RPM}$

7. Check that coupling selected will accept the required shaft diameters. Should shaft diameter exceed maximum permissible, then re-select using next larger size of coupling.

Load Classification by Application

Table 1

Agitators	
Pure liquids	S
Liquids and solids	M
Liquids - variable density	M
Blowers	
Centrifugal	S
Lobe	M
Vane	S
Brewing and distilling	
Bottling machinery	S
Brew kettles - continuous duty	S
Cookers - continuous duty	S
Mash tubs - continuous duty	S
Scale hopper - frequent starts	M
Can filling machines	S
Cane knives (1)	M
Car dumpers	H
Car pullers	M
Clarifiers	S
Classifiers	M
Clay working machinery	
Brick press	H
Briquette machine	H
Clay working machinery	M
Pug mill	M
Compressors	
Centrifugal	S
Lobe	M
Reciprocating - multi-cylinder	M
Reciprocating - single cylinder	H
Conveyors - uniformly loaded or fed	
Apron	S
Assembly	S
Belt	S
Bucket	S
Chain	S
Flight	S
Oven	S
Screw	S
Conveyors - heavy duty not uniformly fed	
Apron	M
Assembly	M
Belt	M
Bucket	M
Chain	M
Flight	M
Live roll	*
Oven	M
Reciprocating	H
Screw	M
Shaker	H
Crane Drives - not dry dock	
Main hoists	S
Bridge travel	*
Trolley travel	*
Crushers	
Ore	H
Stone	H
Sugar (1)	M
Dredges	
Cable reels	M
Conveyors	M
Cutter head drives	H
Jig drives	H
Manoeuvring winches	M
Pumps	M
Screen drive	H
Stackers	M
Utility winches	M
Dry dock cranes	
Main hoist	(2)
Auxiliary hoist	(2)
Boom, luffing	(2)
Rotating, swing or slew	(3)
Tracking, drive wheels	(4)
Elevators	
Bucket - uniform load	S
Bucket - heavy load	M
Bucket - continuous	S
Centrifugal discharge	S
Escalators	S
Freight	M
Gravity discharge	S
Man lifts	*
Passenger	*
Extruders (plastic)	
Film	S
Sheet	S
Coating	S
Rods	S
Tubing	S
Blow moulders	M
Pre-plasticiers	M
Fans	
Centrifugal	S
Cooling towers	
Induced draft	*
Forced draft	*
Induced draft	M
Large, mine etc.	M
Large, industrial	M
Light, small diameter	S
Feeders	
Apron	M
Belt	M
Disc	S
Reciprocating	H
Screw	M
Food industry	
Beef slicer	M
Cereal cooker	S
Dough mixer	M
Meat grinder	M
Generators - not welding	S
Hammer mills	H
Hoists	
Heavy duty	H
Medium duty	M
Skip hoist	M
Laundry	
Washers - reversing	M
Tumblers	M
Line shafts	
Driving processing equipment	M
Light	S
Other line shafts	S
Lumber industry	
Barkers, hydraulic, mechanical	M
Burner conveyor	M
Chain saw and drag saw	H
Chain transfer	H
Craneway transfer	H
De-barking drum	H
Edger feed	M
Gang feed	M
Green chain	M
Live rolls	H
Log deck	H
Log haul - incline	H
Log haul - well type	H
Log turning device	H
Main log conveyor	H
Off bearing rolls	M
Planer feed chains	M
Planer floor chains	M
Planer tilting hoist	M
Re-saw merry-go-round conveyor	M
Roll cases	H
Slab conveyor	H
Small waste conveyor-belt	S
Small waste conveyor-chain	M
Sorting table	M
Tipple hoist conveyor	M
Tipple hoist drive	M
Transfer conveyors	M
Transfer rolls	M
Tray drive	M
Trimmer feed	M
Waste conveyor	M
Machine tools	
Bending roll	M
Punch press - gear driven	H
Notching press - belt drive	*
Plate planners	H
Tapping machine	H
Other machine tools	
Main drives	M
Auxiliary drives	S
Metal mills	
Drawn bench carriage and main drive	M
Pinch, dryer and scrubber rolls, reversing	*
Slitters	M
Table conveyors nonreversing group drives	M
Individual drives	H
Reversing	*
Wire drawing and flattening machine	M
Wire winding machine	M
Mills, rotary type	
Ball (1)	M
Cement kilns (1)	M
Dryers and coolers (1)	M
Kilns other than cement	M
Pebble (1)	M
Rod, plain & wedge bar (1)	M
Tumbling barrels	H
Mixers	
Concrete mixers continuous	M
Concrete mixers intermittent	M
Constant density	S
Variable density	M
Oil industry	
Chillers	M
Oil well pumping	*
Paraffin filter press	M
Rotary kilns	M
Paper mills	
Agitators (mixers)	M
Barker - auxiliaries hydraulic	M
Barker - mechanical	H
Barking drum	H
Beater and pulper	M
Bleacher	S
Calenders	M
Calenders - super	H
Converting machine except cutters, platers	M
Conveyors	S
Couch	M
Cutters, platers	H
Cylinders	M
Dryers	M
Fell stretcher	M
Fell whipper	H
Jordans	M
Log haul	H
Presses	M
Pulp machine reel	M
Stock chest	M
Suction roll	M
Washers and thickeners	M
Winders	M
Printing presses	*
Pullers	
Barge haul	H
Pumps	
Centrifugal	S
Proportioning	M
Reciprocating	
single acting: 3 or more cylinders	M
double acting: 2 or more cylinders	M
single acting: 1 or 2 cylinders	*
double acting: single cylinder	*
Rotary - gear type	S
Rotary - lobe, vane	S
Rubber and plastics industries	
Crackers (1)	H
Laboratory equipment	M
Mixed mills (1)	H
Refiners (1)	M
Rubber calenders (1)	M
Rubber mill, 2 on line (1)	M
Rubber mill, 3 on line (1)	S
Sheeter (1)	M
Tyre building machines	*
Tyre and tube press openers	*
Tubers and strainers (1)	M
Warming mills (1)	M
Sand muller	M
Screens	
Air washing	S
Rotary, stone or gravel	M
Travelling water intake	S
Sewage disposal equipment	
Bar screens	S
Chemical feeders	S
Collectors	S
Dewatering screws	M
Scum breakers	M
Slow or rapid mixers	M
Thickeners	M
Vacuum filters	M
Slab pushers	M
Steering gear	*
Stokers	S
Sugar industry	
Cane knives (1)	M
Crushers (1)	M
Mills (1)	M
Textile industry	
Batchers	M
Calenders	M
Cards	M
Dry cans	M
Dryers	M
Dyeing machinery	M
Looms	M
Mangles	M
Nappers	M
Pads	M
Range drives	*
Slashers	M
Soapers	M
Spinners	M
Tenter frames	M
Washers	M
Winders	M
Windlass	*

Key

S = Steady
M = Medium Impulsive
H = Highly Impulsive
* = Refer to Renold

(1) = Select on 24 hours per day service factor only.
(2) = Use service factor of 1.00 for any duration of service.
(3) = Use service factor of 1.25 for any duration of service.
(4) = Use service factor of 1.50 for any duration of service.

Note

Machinery characteristics and service factors listed in this catalogue are a guide only. Some applications (e.g. constant power) may require special considerations. Please consult Renold.

Service Factors and Selection

Table 2 Service Factor (f_D)

Prime mover (Drive input)	Driven machinery characteristics			
	Duration service hours/day	Steady load	Medium impulsive	Highly impulsive
Electric, air & hydraulic Motors or steam turbine (Steady input)	Intermittent - 3hrs/day max	0.90	1.00	1.50
	3 - 10	1.00	1.25	1.75
	over 10	1.25	1.50	2.00
Multi-cylinder I.C. engine (Medium impulsive input)	Intermittent - 3hrs/day max	1.00	1.25	1.75
	3 - 10	1.25	1.50	2.00
	over 10	1.50	1.75	2.25
Single-cylinder I.C. engine (Highly impulsive input)	Intermittent - 3hrs/day max	1.25	1.50	2.00
	3 - 10	1.50	1.75	2.25
	over 10	1.75	2.00	2.50

Table 3 Factor for Starts/Hour(f_S)

No of starts per hour	0-1	1-30	30-60	60-
Factor	1,0	1,2	1,3	1,5

Example of Selection

Coupling is required to transmit 7.5kW at 1440 RPM to connect an electric motor to a gear box driving a chain conveyor running for 18 hours/day and starting 15 times/hour. Shaft diameters /55mm respectively.

K = 7.5kW

From Table 1 Load Classification = M (medium impulsive)

From Table 2 Service Factor f_D = 1.5

From Table 3 f_S = 1.2

Therefore selection kW is:-

$Ks = K \times f_D \times fS$
$= 7.5 \times 1.5 \times 1.2$
$= 13.5$ kW

Equivalent power at 100 RPM $= \frac{Ks \times 100}{RPM}$

$= \frac{13.5 \times 100}{1440}$

= 0.9375kW @ 100RPM

From page 17 selection is RSC110 (644911) (maximum bore 55 mm).

Key Stress

1. Permissible key stress = 70N/mm^2
2. Nominal torque T_{KM} = K x 9550 / RPM Nm
3. Force at key F = T_{KM} /r
4. Shaft Rad r. metres
5. Key area A = J x HUB length mm
   (Obtain from relevant catalogue page).
6. Key stress fk = F/A N/mm^2
7. If resultant stress is less than 70 N/mm^2 key stress is acceptable.
   If resultant fk is greater than 70, consider either two keyways or extending hub length.
8. Example:

   T_{KM} = 7.5 x 9550/1440 = 49.7Nm

   r = 55/2 = 27.5mm ÷ 1000 = 0.0275m

   F = 49.7/0.0275 = 1741N

   A = 16 x 45 = 720mm^2

   fk = 1741/720 = 2.4M/mm^2

   Selection is therefore good.

For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.

WARNING

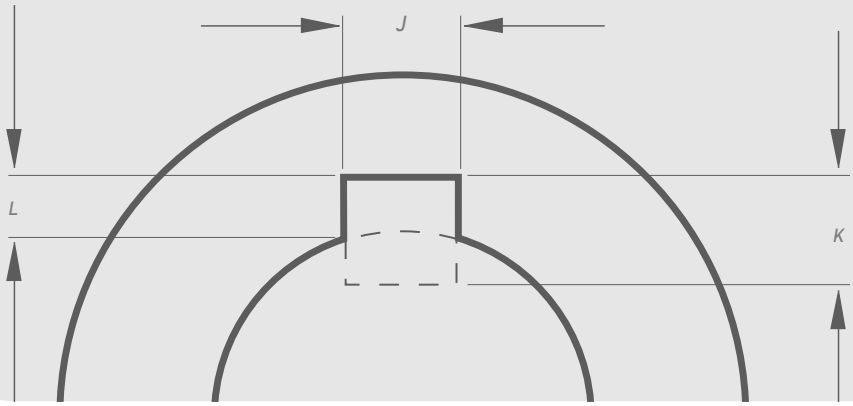
It is the responsibility of the system designer to ensure that the application of the coupling does not endanger the other constituent components in the system. Service factors given are an initial selection guide.

WARNING

Rotating equipment must be provided with a suitable guard before operating or injury may result.

Key and Keyway Dimensions

[*fig 01*]



Metric (mm)

Keyways comply with BS4235: Part 1: 1972

Shaft dia.		Key & keyway		
Over	Incl.	J	K	L
6	8	2	2	1.0
8	10	3	3	1.4
10	12	4	4	1.8
12	17	5	5	2.3
17	22	6	6	2.8
22	30	8	7	3.3
30	38	10	8	3.3
38	44	12	8	3.3
44	50	14	9	3.8
50	58	16	10	4.3
58	65	18	11	4.4
65	75	20	12	4.9
75	85	22	14	5.4
85	95	25	14	5.4
95	110	28	16	6.4
110	130	32	18	7.4
130	150	36	20	8.4
150	170	40	22	9.4
170	200	45	25	10.4
200	230	50	28	11.4

Imperial (inches)

Keyways comply with BS46: Part 1: 1958

Shaft dia.		Key & keyway		
Over	Incl.	J	K	L
0.25	0.05	0.125	0.125	0.060
0.50	0.75	0.187	0.187	0.088
0.75	1.00	0.250	0.250	0.115
1.00	1.25	0.312	0.250	0.090
1.25	1.50	0.375	0.250	0.085
1.50	1.75	0.437	0.312	0.112
1.75	2.00	0.500	0.312	0.108
2.00	2.50	0.625	0.437	0.162
2.50	3.00	0.750	0.500	0.185
3.00	3.50	0.875	0.625	0.245
3.50	4.00	1.000	0.750	0.293
4.00	5.00	1.250	0.875	0.340
5.00	6.00	1.500	1.000	0.384

Keyway dimensions [*fig 01*]

Parallel keyways are supplied unless customer states otherwise.

Chainflex

An all metal flexible yet torsionally stiff coupling, suitable for use in arduous working conditions.

Coupling capacity

- Maximum power @ 100RPM: 90kW
- Maximum torque: 8595Nm

Features and benefits

- Torsionally stiff for use as a positive drive connection.
- Easy installation for ease of maintenance
- Misalignment capabilities allowing flexibility in installation.
- Hardened teeth giving long life with high torque capacity.
- All metal coupling for use in hostile environments.
- Taper bush bores available for ease of maintenance.
- Easy removal of chain for high speed disconnection of driven and driving machines.
- Precison moulded plastic cover with seals for lubrication retention and dust protection.

Standard range comprises

- Shaft to Shaft
- Taper Bush or Parallel Bored

Applications

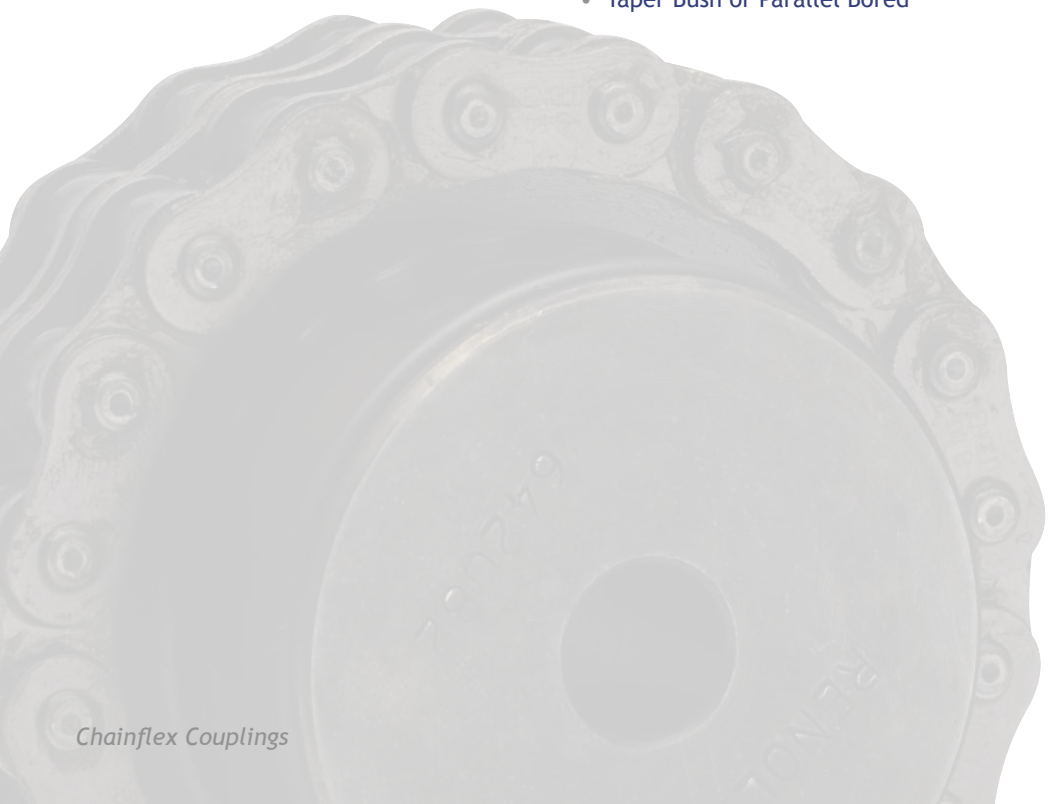
- Fans
- Feeders
- Kiln Dryers
- Line Shafts
- Pump Drives

Construction details

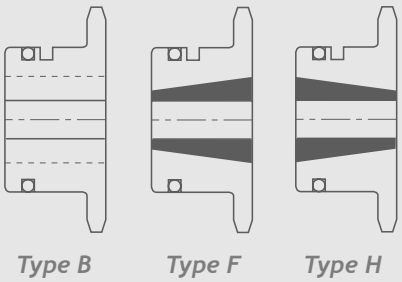
Hardened Steel Sprockets

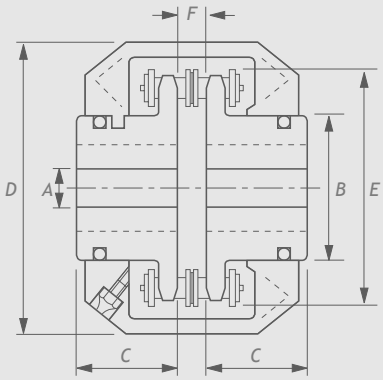
Renold Duplex Chain

Moulded Cover



Chainflex





Ordering code

C 63 # # #

- Chainflex
- Size
- Half body type
  - B - Plain bore
  - F - Taper bush
  - H - Taper bush
- Supplied with or without cover
  - K - With cover
  - R - Rubber/ fabric
- Half body type
  - B - Plain bore
  - F - Taper bush
  - H - Taper bush

Max angular misalignment 1°

Coupling size with cover	Power/ 100rpm kW	Torque nominal Nm	Speed max rpm	Type B		Type F & H			Dimensions						Offset Max mm	End float mm
				Bore		Bush size	Bore		B mm	C mm	D mm	E mm	F mm	Mass kg		
				Max	Min		Max	Min								
C28BB K	0.55	52.5	3500	25	12	N/A	-	-	42	21	72	62	3	0.5	0.25	0.7
C33BB K	1	95.5	3000	30	12	N/A	-	-	50	25	83	74	5.1	1.0	0.25	1.0
C43 # # K	2.25	215	2250	40	14	TB1008	28	9	59	32	108	99	6.9	2.1	0.25	1.3
C63 # # K	7.5	716	1500	60	19	TB1615	42	14	91	51	159	148	8.9	7.1	0.30	2.0
C81 # # K	17.5	1671	1200	80	24	TB2525	60	19	117	63	206	197	16.2	16	0.38	2.5
C101BB K	33.5	3200	960	100	32	N/A	-	-	144	76	258	245	18.8	30	0.38	3.3
C122BB K	60	5730	750	130	50	N/A	-	-	182	101	311	295	25.1	61	0.50	3.8
C140BB K	90	8595	700	140	55	N/A	-	-	195	114	357	343	31.2	85	0.50	4.6

Component Spares

With cover		Without cover		Cover	Half body pilot bored	Half body taper bored F type	Half body taper bored H type	Chain with connectors
Coupling number	Product number	Coupling number	Product number					
C28BBK	642602	C28BB	642802	616602	642080	-	-	114500/96620
C33BBK	642603	C33BB	642803	616603	642081	-	-	114038/96620
C43BBK	642604	C43BB	642804	616604	642082	-	-	114046/96620
C43FFK	642604/77	C43FF	642804/77	616604	-	642082/77	642082/88	114046/96620
C63BBK	642606	C63BB	642806	616606	642084	-	-	114066/96620
C63FFK	642606/77	C63FF	642806/77	616606	-	642084/77	642084/88	114066/96620
C81BBK	642608	C81BB	642808	616608	642086	-	-	114088/96620
C81FFK	642608/77	C81FF	642808/77	616608	-	642086/77	642086/88	114088/96620
C101BBK	642610	C101BB	642810	616610	642088	-	-	114106/96620
C122BBK	642612	C122BB	642812	616612	642090	-	-	114127/96620
C140BBK	642614	C140BB	642814	616614	642092	-	-	114147/96620