

# ***RENOLD***

## ***Couplings***



Resilient and Soft Start Couplings



## **RENOLD** Clutches & Couplings

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### Products:

Shaft Couplings, Resilient Gear and Fluid Soft-Start,  
Clutches: Sprag and Trapped Roller Freewheels,  
Slipping and Air Types.

**Contents**

	<b>Page No</b>
Company Profile	5
Typical Applications	6 - 7
Pictorial Contents	8 - 9
Coupling Selection Guide	11
Selections	12 - 15
Taper Bushes	16
Spiderflex	17 - 19
Spider	20
Pinflex	21 - 25
Crownpin	26 - 28
Tyreflex	29 - 31
Discflex	33 - 35
Chainflex	36 - 37
Rigid	38
Gearflex	39 - 47
Hydrastart	49 - 61
Electric Motor Shaft Dimensions	55
Renold Hi-Tec Coupling Range	62 - 92
Renold Worldwide Sales & Services	94 - 95

# Be Flexible

*and stay connected*

## When size does matter, the Gearflex Flexible Coupling from Renold will not let you down.

Its large size and flexibility makes it ideal for even the most demanding applications. The design allows maximum power capacity as well as excellent misalignment capacity to ensure that you stay connected. And with optimum contact and long life, it really does make light work of heavy duty applications.

The Gearflex Flexible Couplings are part of a diverse range of clutches and couplings manufactured by Renold, designed to meet customer's unique requirements.

## High torque, flexible coupling for use on heavy duty applications.

### Features

- Heavy duty gear coupling for strength in application
- AGMA standard  
- interchangeable and cost effective
- Single and double engagement types available
- Crowned and barrelled teeth for optimum contact and long life
- Mill motor, shear pin and telescopic designs to give total design suitability for demanding applications



## **RENOLD** Couplings

Renold Couplings is a trading division of Renold Plc., which is dedicated to coupling solutions and freewheel clutches. This includes the Renold, HiTec and AJAX range of products.

Tel +44(0) 29 20792737, Fax: +44(0) 29 20793004, (Sales): +44(0) 29 20791360, e-mail: [sales@cc.renold.com](mailto:sales@cc.renold.com), [www.renold.com](http://www.renold.com)

## Renold Clutches & Couplings

Renold have been manufacturing flexible and rigid couplings, sprag and air clutches for over 50 years. The Renold Couplings factories are based in two UK locations, Cardiff and Halifax.



### RENOLD Clutches & Couplings - Cardiff

In 1991 the company moved to a purpose-built factory in Wentloog, Cardiff, in which state-of-the-art machining and inspection facilities are to be found, all supporting a high level of personal customer care.



### RENOLD Hi-Tec Couplings - Halifax

The Halifax factory (formally Holset Engineering Ltd.) became a member of Renold plc in 1996. The operation also includes the latest machining and tooling technology with integrated cellular manufacturing and complete testing and balancing capabilities.



All Renold Couplings are manufactured in the UK to Renold exacting standards.

### Service Excellence & Care

Renold offers a unique level of service excellence and customer care. Our experienced applications engineers will select the optimum solution, with the aid of the latest computer and design technology.



The **RENOLD** organisation stretches worldwide

- 16 National Sales Companies
- Over 70 Overseas Distributors

Offering the comprehensive **RENOLD** range of power transmission products directly or through local distributor networks



### Special Solutions and Innovations

Renold is recognised throughout the industry for its capability to create specific solutions to customers unique requirements. International companies and industries, from steel to food processing to escalators to textile machinery, have chosen Renold to solve their problems.



### Leading Edge Technology

Renold provides practical cost effective solutions with a commitment to value through quality. This is achieved by the continuous investment in people, process technology and manufacturing.



### Consistent Reliability

Renold's 100 years of experience in the design and manufacturing of power transmission products to the highest specifications, with proven performance in diverse industries world-wide, underwrites the guaranteed quality and the assurance of reliability.

Renold Clutches & Couplings is BS EN ISO 9001:2000 approved. All products are designed and manufactured to this Quality Assurance System.



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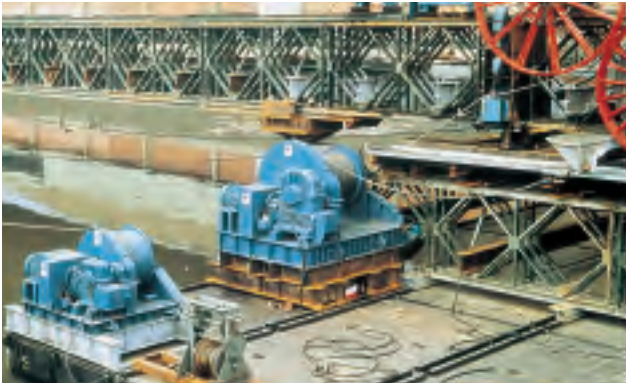
Certificate 9079

### Testing

Although each of our factories manufacturing and testing demands vary, the following capabilities are available if the application demands it:

- Full scale radial and axial stiffness measurement.
- Torsional vibration analysis.
- Misalignment testing of couplings up to 2 metres diameter.
- Measurements of torsional stiffness up to 220 KNM
- Static and dynamic balancing capabilities.
- Noise attenuation testing.
- Transient and finite element analysis.

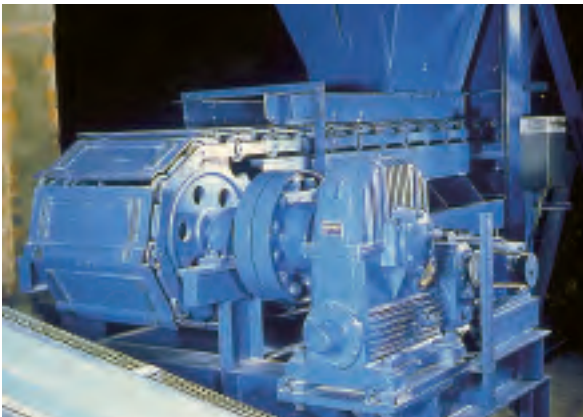
## Flexible and Soft Start Couplings - Typical Applications



### Pinflex

A robust general purpose pin/buffer coupling, providing reliable fail safe transmission of torque and misalignment capability.

- Pumps
- Compressors
- Conveyors



### Spider Couplings

Relatively low power but highly flexible coupling with halfbodies in either cast iron or bronze, making suitable for use in the food or chemical/pharmaceutical industries.

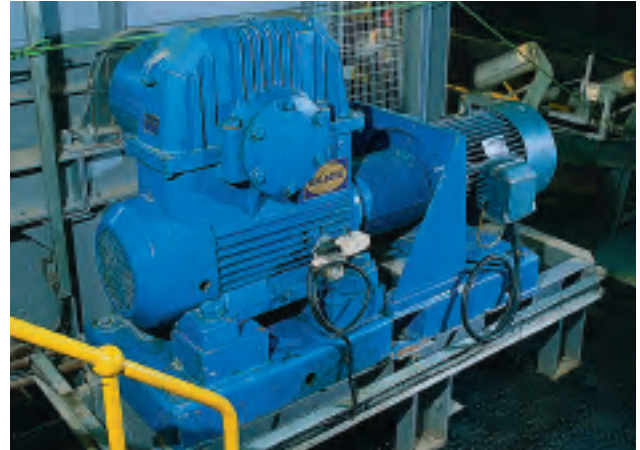
- Pumps
- Mixers
- Lube Systems



### Hydrastart

A fluid coupling suitable for soft starting high inertia machinery with reduced current demand, controlled acceleration and torque with drive overload protection.

- Conveyors
- Rotary Kilns
- Ball Mills
- Fans
- Centrifuges



### Crown Pin

An established pin/buffer coupling offering extended power capacity where the demand for long life and simplicity of construction make it suitable for working in arduous conditions.

- Conveyors
- Washers
- Pumps
- Screens
- Cranes
- General Industrial Application



### Gearflex

Heavy duty all metal couplings giving maximum power capacity within minimum space envelope and excellent misalignment capacity.

- Steelworks
- Quarries
- Mining

## Flexible and Soft Start Couplings - Typical Applications

### Discflex

A general purpose, fail safe, torsionally flexible coupling offering the option of either urethane or reinforced rubber disc.

- Pumps
- Compressors
- Conveyors
- Mixers



### Spiderflex

A medium powered, torsionally flexible coupling, combining shock absorbing and misalignment. Used in the widest range of industries and applications.



### Tyreflex

A range of highly flexible couplings offering excellent misalignment capacity and suitable to absorb both shock loads and vibrations.

- Pumps
- Compressors
- Diesel Engines
- Roller Tables



### RB

0.24 RB flywheel mounted coupling on a Deutz TD 229 - 6 diesel generator set in Spain.

- Generator Sets
- Pump Sets
- Compressors
- Bulk Handling

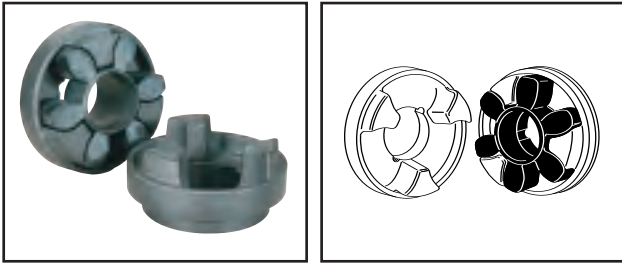


### PM

2 off PM600 on a nickel grinding mill at Leinster in Western Australia.

- Metal Manufacturing
- Pumps
- Fans
- Compressors
- Pulp and Paper
- Cranes and hoists

### Spiderflex Coupling

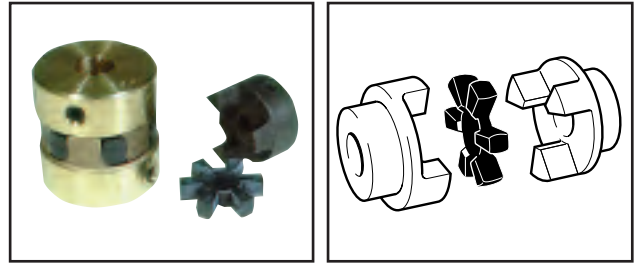


#### **The Interchangeable & Cost Effective Solution**

A medium powered torsionally flexible coupling, combining shock absorbing and misalignment capacity. Used in the widest range of industries and applications.

Max Kw @ 100 rpm:	35
Max Torque:	3308 Nm
Page No	17

### Spider Coupling

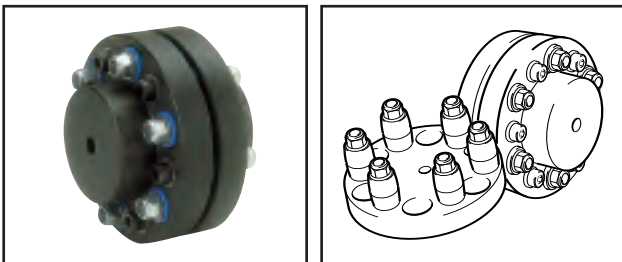


#### **The Cost Effective Solution**

Small powered, torsionally flexible coupling with shock absorbing and misalignment capacity.

Max Kw @ 100 rpm:	1.12
Max Torque:	107 Nm
Page No	20

### Pinflex Coupling

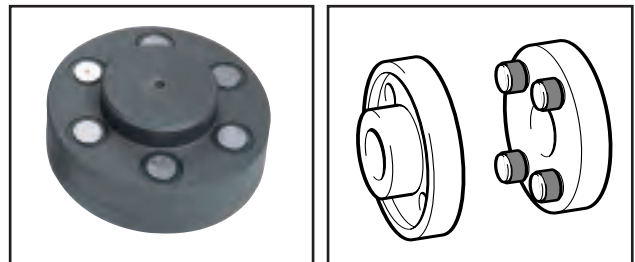


#### **The Popular Choice**

A robust general purpose pin/buffer coupling, providing reliable fail safe transmission of torque and misalignment capability.

Max Kw @ 100 rpm:	340
Max Torque:	32500 Nm
Page No	21

### Crownpin Flexible Coupling

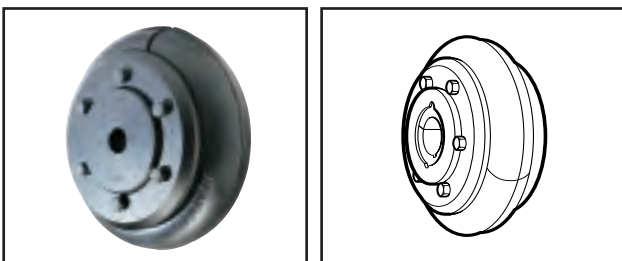


#### **The Reliable Solution**

An established pin/buffer coupling, offering extended power capacity where the demand for long life and simplicity of construction make it suitable for working in arduous conditions.

Max Kw @ 100 rpm:	2611
Max Torque:	249400 Nm
Page No	26

### Tyreflex Coupling

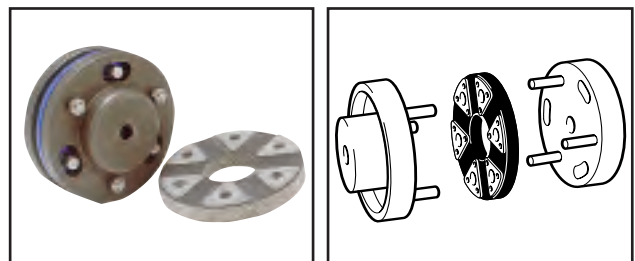


#### **The Interchangeable Resilient Solution**

A range of highly flexible couplings offering excellent misalignment capacity and suitable to absorb both shock loads and vibrations.

Max Kw @ 100 rpm:	65.8
Max Torque:	6270 Nm
Page No	29

### Discflex Coupling



#### **The Positive Solution**

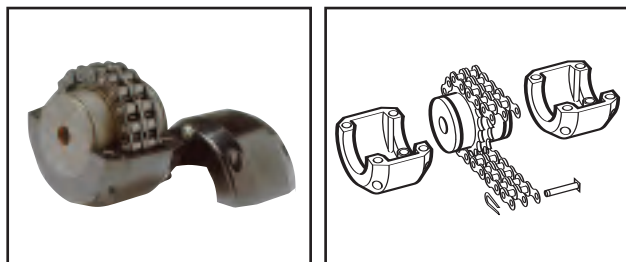
A general purpose, fail safe, torsionally flexible coupling offering the option of either urethane or reinforced rubber disc as the flexible element.

Max Kw @ 100 rpm:	45
Max Torque:	4298 Nm
Page No	33



## Pictorial Contents

### Chainflex Coupling

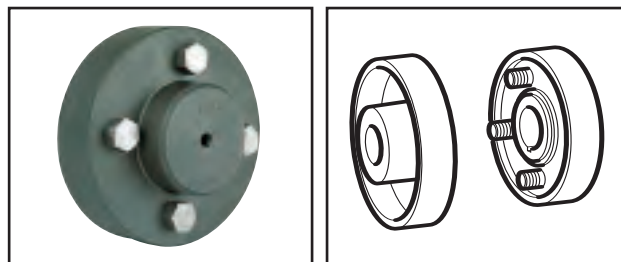


#### **The Flexible Solution**

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

Max Kw @ 100 rpm:	90
Max Torque:	8595 Nm
Page No	36

### Rigid Coupling

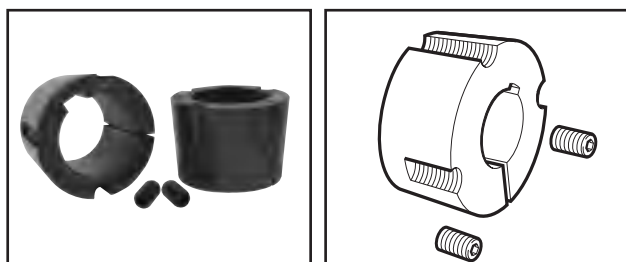


#### **The Rigid Solution**

Rigid all metal medium/high power coupling for a non-flexible, positive connection.

Max Bore Size:	290 mm
Page No	38

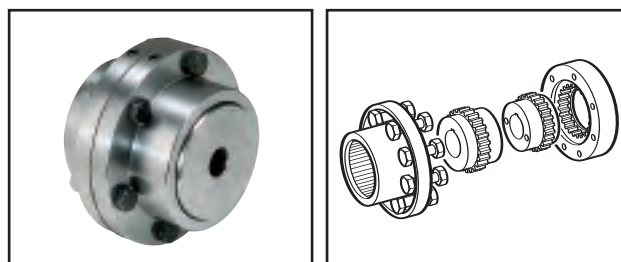
### Taper Bushes



#### **The Easy Maintenance Solution**

Max Bore Size:	125mm
Page No	16

### Gearflex Coupling - Double Engagement

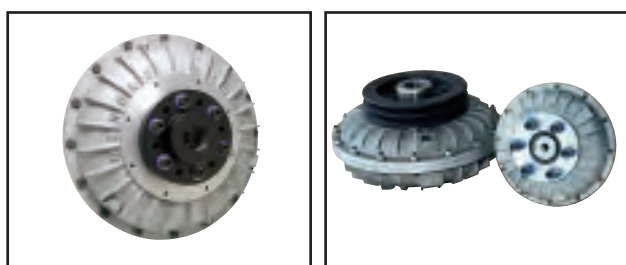


#### **The High Torque Solution**

Heavy duty all metal couplings giving maximum power capacity within minimum space envelope and excellent misalignment capacity.

Max Kw @ 100 rpm:	50485
Max Torque:	4747000 Nm
Page No	39

### Hydrastart Standard Fill

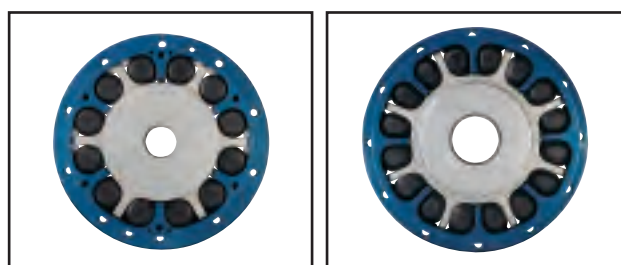


#### **The Soft Start Solution**

A fluid coupling suitable for soft starting high inertia machinery with reduced current demand, controlled acceleration and torque with drive overload protection.

Max Kw @ 1500 rpm:	600
Max Speed:	3,500 rpm
Page No	49

### RB & PM Couplings



#### **The Heavy Duty Solution**

Max Torque	6000KNm
Page No's	64 and 76

# Forward Thinking

*clutches from Renold*



**For clutches that are moving the industry in the right direction, look no further than Renold.**

The range of freewheel clutches allow rotation in one direction but not the other, which acts as a backstop to prevent reversing of a load. Available as either a trapped roller or sprag clutch device, the freewheels provide the ultimate in clutch control.

**Above all, the range is interchangeable with other brands, making them the most adaptable, forward thinking clutches of their kind.**

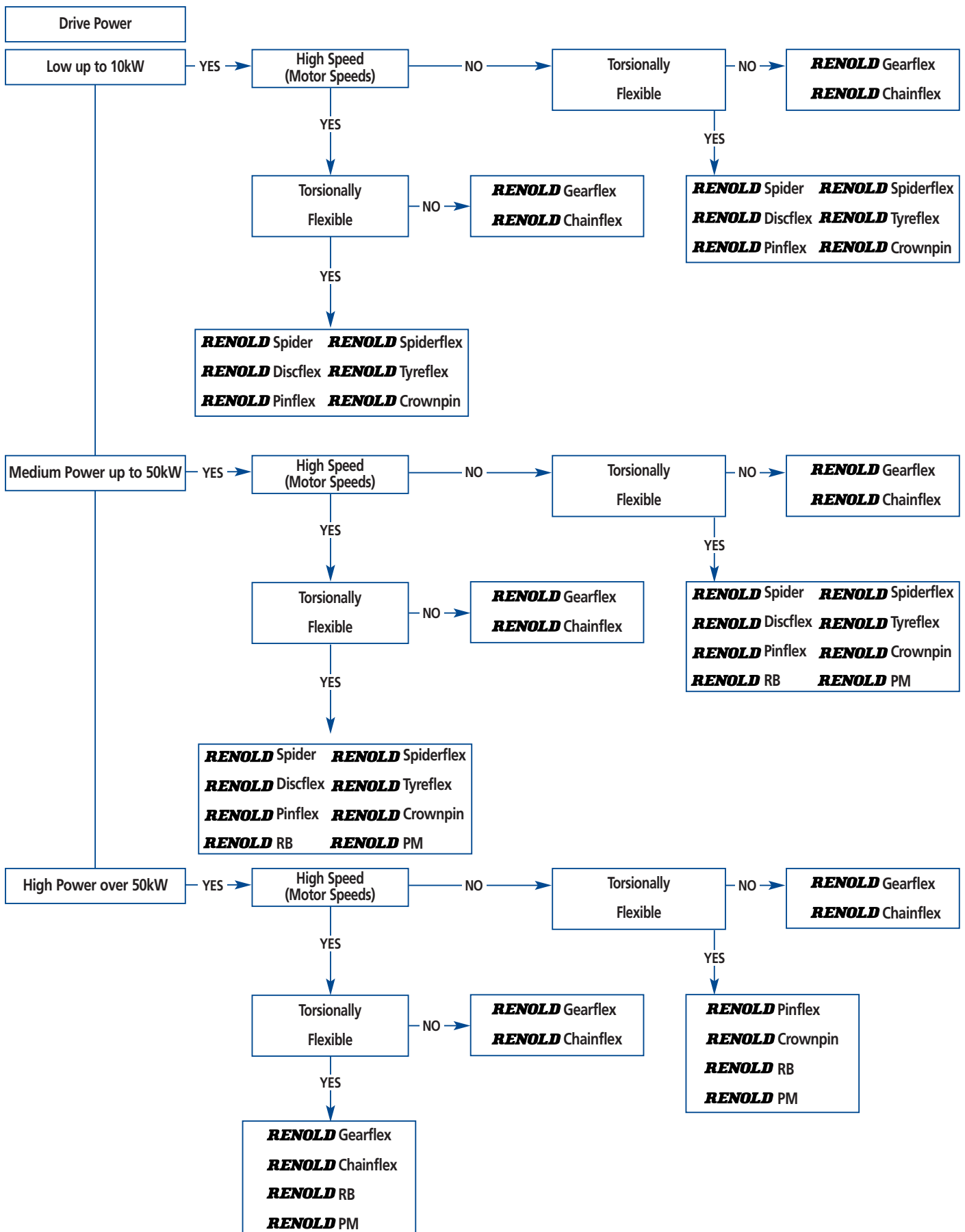
The freewheels are part of a diverse range of clutches and couplings manufactured by Renold, designed to meet customer's unique requirements.

## **RENOLD** Couplings

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## Coupling Selection Guide

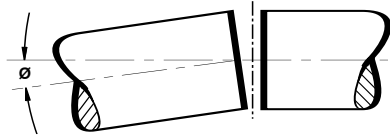


## Selection of Couplings

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

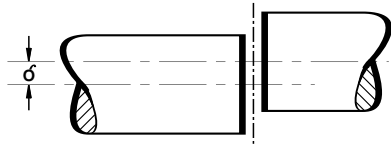
At installation all couplings should be aligned as near to perfect as possible.

### 1. Angular



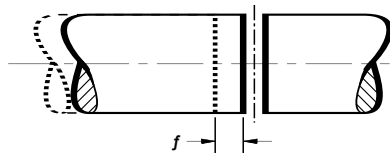
Angular misalignment is present when the shaft axes are inclined one to the other. Its magnitude can be measured at the coupling faces.

### 2. Parallel Offset



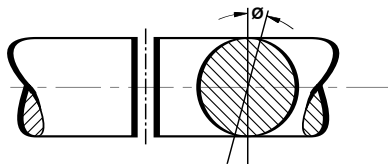
Axial misalignment is present when the axes of the driving and driven shafts are parallel but laterally displaced.

### 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

- Normal.
- Maximum.
- Whether continuous or intermittent.

#### Characteristics of the drive

- Type of prime mover and associated equipment.
- Degree of impulsiveness of driven load.

#### Speed in revolutions per minute

- At which normal power is transmitted.
- At which maximum power is transmitted.
- Maximum speed.

#### Dimensions of shafts to be connected

- Actual diameter.
- Length of shaft extension.
- 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 14).

### Selection Procedure

- Nominal power in kW to be transmitted =  $K$ .
- Select appropriate load classification from Table 1, denoted as either S, M or H.
- From Table 2, establish Service Factor(s) to be applied, taking into account hours of operation/day and prime mover =  $fD$ .
- From Table 3 select factor for the required frequency of starts/hr =  $f_s$ .
- Selection Power  $K_s = K \times f_D \times f_s$
- Equivalent power at 100 RPM =  $\frac{K_s \times 100}{\text{RPM}}$
- 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**

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

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. Consult Renold.

## Service Factors and Selection

### Service Factors

**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

### 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:-

$$\begin{aligned} K_s &= K \times f_D \times f_S \\ &= 7.5 \times 1.5 \times 1.2 \\ &= 13.5 \text{ kW} \end{aligned}$$

$$\begin{aligned} \text{Equivalent power at 100RPM} &= \frac{K_s \times 100}{\text{RPM}} \\ &= \frac{13.5 \times 100}{1440} \\ &= 0.9375 \text{ kW @ 100RPM} \end{aligned}$$

From page 16 selection is RSC110 (644911) (maximum bore 55 mm).

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.

**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

### Note

For applications with excessive vibration, contact Renold Technical Department.

### Key Stress

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

$$T_{KM} = 7.5 \times 9550/1440 = 49.7Nm$$

$$r = 55/2 = 27.5mm \div 1000 = 0.0275M$$

$$F = 49.7/0.0275 = 1741N$$

$$A = 16 \times 45 = 720mm^2$$

$$f_k = 1741/720 = 2.4M/mm^2$$

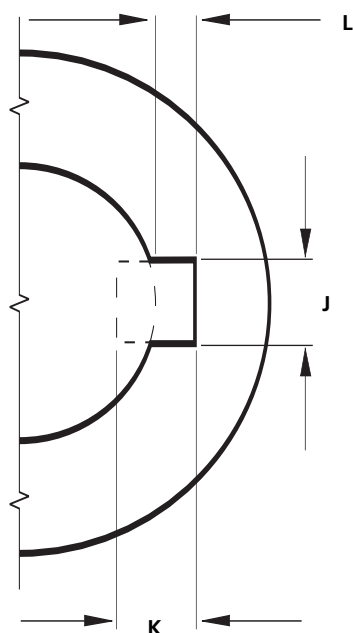
Selection is therefore good.



**WARNING**

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

## Key and Keyway Dimensions



### Keyway dimensions

Parallel keyways are supplied unless customer states otherwise.

### Metric (mm)

Keyways comply with BS4235: Part 1: 1972

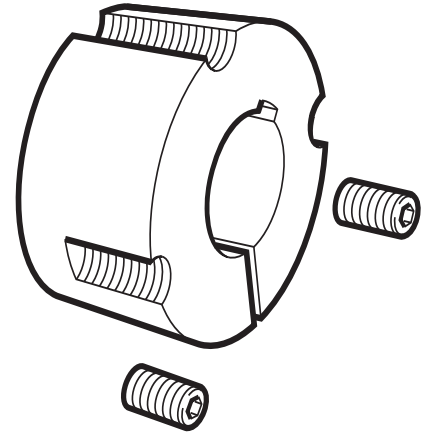
Shaft dia.		Key & Keyway		
Over	Incl.	J	K	L
6	8	2	2	1.0
8	10	3	3	1.4
10	12	4	4	1.8
12	17	5	5	2.3
17	22	6	6	2.8
22	30	8	7	3.3
30	38	10	8	3.3
38	44	12	8	3.3
44	50	14	9	3.8
50	58	16	10	4.3
58	65	18	11	4.4
65	75	20	12	4.9
75	85	22	14	5.4
85	95	25	14	5.4
95	110	28	16	6.4
110	130	32	18	7.4
130	150	36	20	8.4
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	0.50	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

## Range of Taper Bushes



### Metric Range

Bush No.	Range of Bores (mm)																		
TB 1008	9	10	-	12	14	16	18	19	20	22	24*	25*							
TB 1108	9	10	11	12	14	15	16	18	19	20	22	24	25	28*					
TB 1210	11	12	14	16	18	19	20	22	24	25	28*	30*	32*						
TB 1215	11	12	14	16	18	19	20	22	24	25	28	30	32*						
TB 1610	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42				
TB 1615	14	16	18	19	20	22	24	25	28	30	32	35	38	40*	42*				
TB 2012	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	44	45	48	50
TB 2017	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50*			
TB 2517	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
TB 2525	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60		
TB 3020	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75			
TB 3030	35	38	40	42	45	48	50	55	60	65	70	75							
TB 3525	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90	95	100*		
TB 3535	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90				
TB 4030	40	42	45	48	50	55	60	65	70	75	80	85	90	95	100				
TB 4040	40	42	45	48	50	55	60	65	70	75	80	85	90	95	100				
TB 4535	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125				
TB 5050	70	75	80	85	90	95	100	105	110	115	120	125							

### Imperial Range

Bush No.	Range of Bores (inches)																			
TB1008	0.375	0.437	0.50	0.625	0.75	1.00*														
TB 1108	0.375	0.50	0.625	0.75	0.875	1.00	1.125*													
TB 1210	-	0.50	-	0.625	-	0.75	-	-	-	1.00	-	-	1.25							
TB 1215	-	0.50	0.562	0.625	-	0.75	-	0.875	-	1.00	-	-	1.125							
TB 1610	0.50	-	0.625	-	0.75	-	0.875	-	1.00	-	1.125	1.25	-	-	-	1.50	1.625			
TB 1615	0.50	-	0.625	-	0.75	-	0.875	-	1.00	-	1.125	1.25	-	1.375	1.437	1.50	1.625*			
TB 2012	0.50	0.625	0.75	0.875	1.00	-	1.125	-	1.25	-	1.375	1.50	1.625	1.75	1.87	2.0				
TB 2017	0.75	0.812	0.875	0.937	1.00	-	1.125	-	1.25	-	1.375	1.50	1.625	1.75	1.875	2.00				
TB 2517	0.75	0.875	-	1.00	-	1.125	-	1.25	-	1.375	1.437	1.625	1.75	1.875	2.00	2.125	2.25	2.375*	2.50	
TB 2525	-	-	1.00	-	1.125	-	1.25	-	1.375	-	1.50	1.75	1.875	2.00	2.125	2.25	2.375*	2.50*		
TB 3020	1.25	-	1.375	-	1.50	1.625	1.75	1.875	2.00	2.125	2.25	2.50	2.625	2.75	2.875	3.00				
TB 3030	-	-	1.375	-	1.50	1.625	1.75	1.875	2.00	2.125	2.25	2.50	2.625	2.75	2.875	3.00				
TB 3525	1.50	1.625	1.75	1.875	2.00	2.125	2.25	2.375	2.50	2.625	2.75	3.00	3.125	3.25	3.50	3.75*	4.00*			
TB 3535	1.50	1.625	1.75	1.875	2.00	2.125	2.25	2.375	2.50	2.625	2.75	3.00	3.125	3.25	3.50					
TB 4030	1.75	1.875	2.00	2.125	2.25	2.375	2.50	2.625	2.75	2.875	3.00	3.125	3.25	3.375	3.50					
TB 4040	1.75	1.875	2.00	2.125	2.25	2.375	2.50	2.625	2.75	2.875	3.00	3.25	3.375	3.50	3.625	3.75*	4.00			
TB 4535	2.25	2.375	2.50	2.625	2.75	2.875	3.00	3.125	3.25	3.375	3.50	3.75	4.00	4.25	4.50	4.75	5.00*			
TB 5050	2.75	2.875	3.00	3.25	3.375	3.50	3.75	4.00	4.25	4.50	5.00									

\*Shallow key Depth. N.B. When ordering specify both bush number and bore size required.



## Spiderflex



**A medium power torsionally flexible coupling combining shock absorbing and misalignment capacity, used in the widest range of industries and applications.**

**Coupling Capacity:**

- Maximum power @ 100RPM 33kW
- Maximum torque 3150Nm

**Features & Benefits:**

- Torsionally flexible - shock absorbing, extending machine life.
- Maintenance free - minimum number of wearing parts.
- Misalignment capabilities allowing flexibility in installation.
- Cost effective - offering a low cost product with high quality design.
- Dimensionally similar to other spider couplings - interchangeable.
- Optional fire retardent anti-static elements for use in flameproof environment.
- Taper bush bores available for ease of maintenance.
- Compact design - small, with high torque capacity.

**Standard Range Comprise:**

- Shaft to Shaft
- Flywheel to Shaft
- Taper Bush or Parallel Bore

**Applications:**

- Bulk Handling
- Compressors
- Generator Sets
- Metal Manufacture
- Pumps
- General Industrial Applications

**Construction Details:**

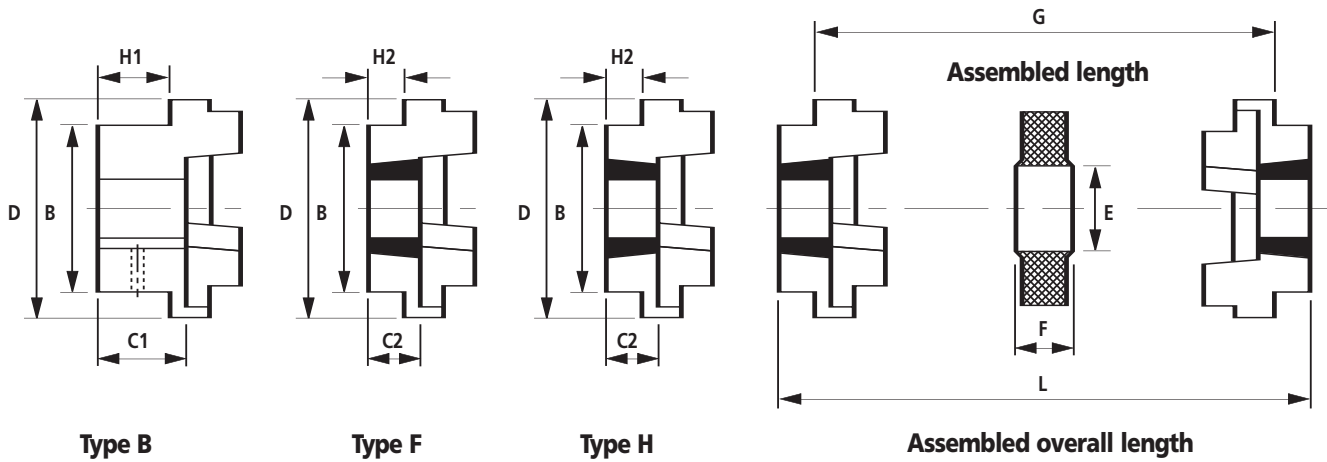
Cast Iron Half Bodies Grade G220

Standard Element Shore Harness A90  
Temp Range -30 + 100°C

F.R.A.S. Element Shore Harness A78  
Temp Range -30 + 95°C

***Spiderflex - The Interchangeable Cost Effective Solution***

## Spiderflex



Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max rpm	Type B		Type F & H			Max. Misalignment		End Float mm
				Bore Dia		Bush Size	Bore		Offset mm	Angular deg	
				Max	Min		Max	Min			
RSC70 ###	0.33	32	7700	32	0	TB1008	25	9	0.3	0.5	+2
RSC90 ###	0.84	80	6300	42	0	TB1108	28	9	0.3	0.5	+5
RSC110 ###	1.68	160	5000	55	0	TB1610	42	14	0.3	1	+6
RSC130 ###	3.30	315	4100	60	0	TB1610	42	14	0.4	1	+8
RSC150 ###	6.28	600	3600	70	0	TB2012	50	14	0.4	1.5	+9
RSC180 ###	9.95	950	3000	80	0	TB2517	60	16	0.4	1.5	+1.1
RSC230 ###	21	2000	2600	100	48	TB3020	75	25	0.5	2	+1.3
RSC280 ###	33	3150	2200	115	60	TB3525	90	35	0.5	2.5	+1.7

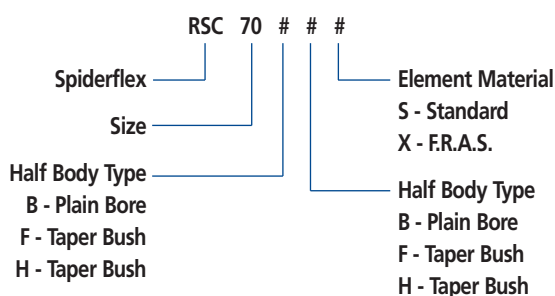
Coupling Size	Dimensions									Assembled Overall Length L		
	B mm	C1 mm	C2 mm	D mm	E mm	F mm	G mm	H1 mm	H2 mm	With Half Body Combinations:-		
										BB	FF, FH, HH	FB, HB
RSC70 ###	61	23.5	23.5	69	31	18	25	20	20.0	65	65	65
RSC90 ###	70	30.0	23.5	85	32	22.5	30.5	26	19.5	83	70	77
RSC110 ###	100	45.0	26.5	112	45	29	45	37	18.5	119	82	101
RSC130 ###	105	55.5	26.5	139	50	36	53	47	18.0	147	89	118
RSC150 ###	115	60.0	33.5	150	62	40	60	50	23.5	160	107	134
RSC180 ###	125	70.0	46.5	180	77	49	73	58	34.5	189	142	166
RSC230 ###	155	90.0	52.5	225	99	59.5	85.5	77	39.5	240	164	202
RSC280 ###	206	105.5	66.5	275	119	74.5	105.5	90	51.0	285	207	246

1. At speeds exceeding allowable maximum speed, consult Renold.
2. Both moment of inertia and coupling weight have been calculated assuming fitting of taper bush of medium bore size.
3. For information on torsional stiffness, consult Renold.

## Spiderflex

Coupling Size	Coupling Mass Kg	Coupling Inertia WR <sup>2</sup>	
		Type B Kg m <sup>2</sup>	Type F&H Kg m <sup>2</sup>
RSC70	1.00	0.00078	0.00085
RSC90	1.17	0.00108	0.00115
RSC110	5.00	0.00344	0.00400
RSC130	5.46	0.00850	0.00780
RSC150	7.11	0.02112	0.01810
RSC180	16.60	0.04820	0.04340
RSC230	26.00	0.14052	0.12068
RSC280	50.00	0.54790	0.44653

### Ordering Code

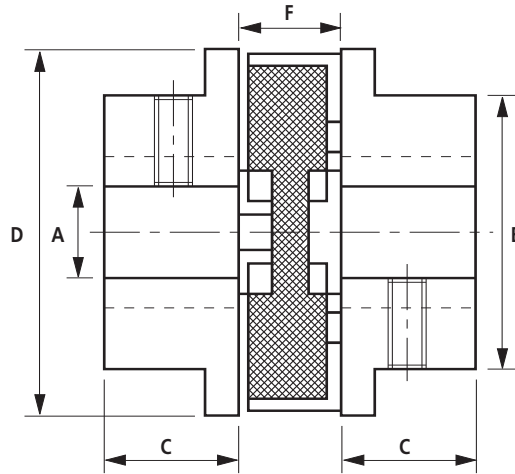


Specials available, e.g. Shear Pin, Extended Boss, Flywheel Flange, Spacer.  
Contact Renold for details.

### Component Spares

Spider Flexible Element	Half Body Unbored Type B	Half Body Taper Bored Type F	Half Body Taper Bored Type H
RSC70 EL	RSC70 B	RSC70 F	RSC70 H
RSC90 EL	RSC90 B	RSC90 F	RSC90 H
RSC110 EL	RSC110 B	RSC110 F	RSC110 H
RSC130 EL	RSC130 B	RSC130 F	RSC130 H
RSC150 EL	RSC150 B	RSC150 F	RSC150 H
RSC180 EL	RSC180 B	RSC180 F	RSC180 H
RSC230 EL	RSC230 B	RSC230 F	RSC230 H
RSC280 EL	RSC280 B	RSC280 F	RSC280 H

## Spider

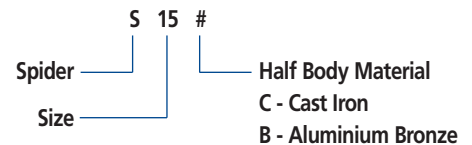


Coupling Number	Power /100rpm Kw	Torque Nominal Nm	Speed Max rpm	Bore A		Stock Bore mm	Dimensions					Misalignment		End Float mm
				Max mm	Min mm		B mm	C* mm	D mm	F mm	Mass kg	Angular Max degrees	Offset Max mm	
S11C	0.025	2.39	11000	14	0	6	28	12	28	8.8	0.12	1°	0.25	0.25
S11B	0.025	2.39	11000	12	0	6	28	12	28	8.8	0.13	1°	0.25	0.25
S15C	0.061	5.83	6500	20	0	12	38	14	38	11.8	0.26	1°	0.25	0.38
S15B	0.061	5.83	6500	20	0	12	38	14	38	11.8	0.27	1°	0.25	0.38
S21C	0.28	26.74	4800	25	0	14	48	21	55	16.2	0.68	1°	0.25	0.51
S21B	0.28	26.74	4800	25	0	N/A	48	21	55	16.2	0.70	1°	0.25	0.51
S30C	0.56	53.5	4800	30	0	19	57	27	78	22.9	1.57	1°	0.25	0.76
S30B	0.56	53.5	4800	30	0	N/A	57	27	78	22.9	1.63	1°	0.25	0.76
S37C	1.12	107	3500	42	0	24	83	36	95	26.2	3.53	1°	0.25	0.89
S37B	1.12	107	3500	42	0	N/A	83	36	95	26.2	3.66	1°	0.25	0.89

### Component Spares

Coupling Number	Product Number Pilot Bored	Product Number Unbored	Spider Flexible Element	Half Body Pilot Bored	Half Body Solid Boss Unbored
S11C	644801	644821	644851	644826	644846
S11B	644813	644817	644851	644838	644842
S15C	644802	644822	644852	644827	644847
S15B	644814	644818	644852	644839	644843
S21C	644803	644823	644853	644828	644848
S21B	644815	644819	644853	644840	644844
S30C	644804	644824	644854	644829	644849
S30B	MTO	MTO	644854	MTO	MTO
S37C	644805	644825	644855	644830	644850
S37B	MTO	MTO	644855	MTO	MTO

### Ordering Code



MTO - Made To Order only - please ask for details.

\* To avoid fouling spider, shaft length inside coupling half-body must not exceed this dimension

## Pinflex



**A robust, general purpose pin/buffer coupling providing reliable fail safe transmission of torque and misalignment capability.**

**Coupling Capacity:**

- Maximum power @ 100RPM    340kW
- Maximum torque                    32500Nm

**Features & Benefits:**

- Steel half bodies, strong yet compact.
- Heavy duty pin and buffer coupling - for heavy shock load conditions.
- Torsionally flexible - shock absorbing, extending machine life.
- Maintenance free - minimum number of wearing parts.
- Misalignment capabilities allowing flexibility in installation.
- Steel Half Bodies.
- Polyurethane buffers, reliable/flexible and temperature resistant.
- Modular construction - available as coupling, brakedrum and shear pin designs.
- Taper bores available for ease of maintenance.

**Standard Range Comprise:**

- Shaft to Shaft
- Shear Pin
- Brake Drum/Disc

**Applications:**

- Conveyors
- Escalators
- Mixers
- Pumps
- General Industrial Applications

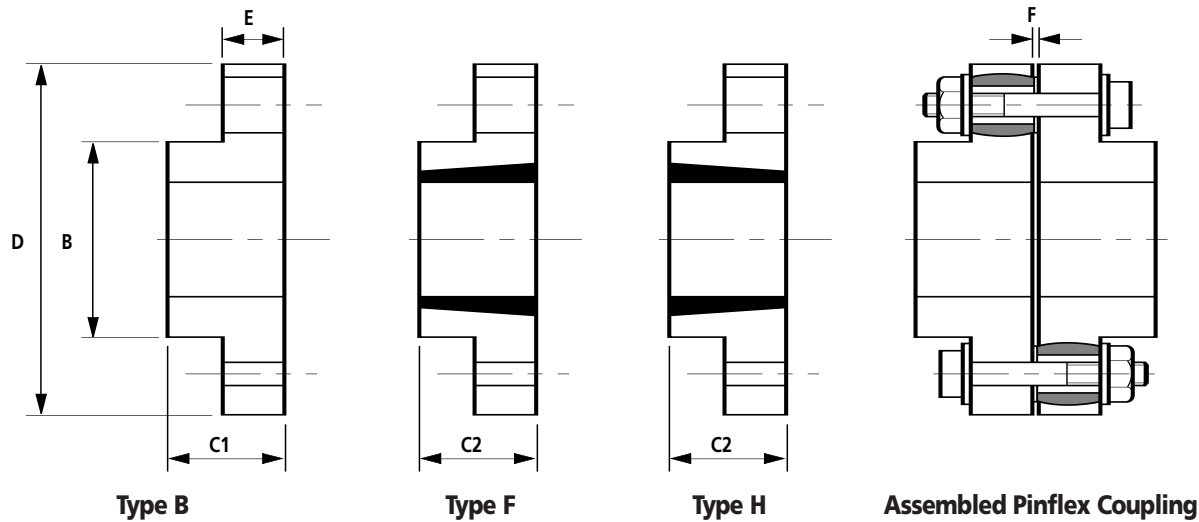
**Construction Details:**

Steel Half Bodies

Urethane Buffer: Temp Range - 40°C to + 80°C

***Pinflex - The Popular Choice***

## Pinflex



Catalogue Number	Power /100rpm Kw	Torque Nominal Nm	Speed Max rpm	Type B		Type F & H			Dimensions						Type B		Type F & H	
				Bore		Bush Size	Bore		B mm	C1 mm	C2 mm	D mm	E mm	F mm	Mass* kg	WR <sup>2*</sup> kg m <sup>2</sup>	Mass* kg	WR <sup>2*</sup> kg m <sup>2</sup>
				Max	Min		Max	Min										
PF1# #3	2.03	194	6800	50	0	TB1215	32	11	70	44	40	125	20	4	5.2	0.00828	5.0	0.00813
PF1# #6	4.05	387																
PF1BB9	6.08	581																
PF1BB12	8.1	774	5900	55	0	TB1615	42	14	80	50	40	145	25	5	8.3	0.01843	7.6	0.01780
PF2# #3	3.59	343																
PF2# #6	7.18	685																
PF2BB9	10.76	1028	5200	72	0	TB2017	50	18	100	60	47	165	25	5	13.8	0.03335	12.1	0.03143
PF2BB12	14.35	1370																
PF3# #3	4.24	405																
PF3# #6	8.48	810	4400	80	0	TB2525	60	19	113	75	65	195	35	6	22.0	0.08470	20.3	0.08195
PF3BB9	12.71	1214																
PF3BB12	16.96	1620																
PF4# #3	8.32	795	3600	110	0	TB3030	75	35	150	89	80	235	35	6	37.8	0.19972	35.3	0.19274
PF4# #6	16.65	1590																
PF4BB9	24.97	2384																
PF4BB12	33.29	3179	2900	130	55	TB3535	90	35	180	110	91	290	50	7	73.2	0.61140	65.2	0.58086
PF5# #4	13.94	1331																
PF5# #8	27.88	2662																
PF5# #12	41.82	3994	2600	150	65	TB4040	100	40	210	130	105	320	50	7	103.0	0.99756	88.5	0.92310
PF5BB16	55.76	5325																
PF6# #3	24.70	2359																
PF6# #6	49.40	4717	2200	175	75	TB5050	125	70	245	150	130	380	60	7	168.8	2.33646	154.1	2.22610
PF6# #9	74.10	7076																
PF6BB12	98.80	9435																
PF7# #4	37.18	3550	1700	260	75	N/A	N/A	N/A	355	220	-	490	60	7	423.0	9.19000	N/A	N/A
PF7# #8	74.35	7100																
PF7# #12	111.53	10650																
PF7BB16	148.70	14200	255.00	24385	340.00	32500												
PF8# #4	64.70	6179																
PF8# #8	129.40	12357																
PF8# #12	194.10	18536																
PF8BB16	258.80	24714																
PF9BB4	85.00	8130																
PF9BB8	170.00	16255																
PF9BB12	255.00	24385																
PF9BB16	340.00	32500																

NOTE: Maximum power and torques for taper bore options are limited by the taper bush capacity.

\* Values are for couplings with no bore and a full set of pin assemblies.

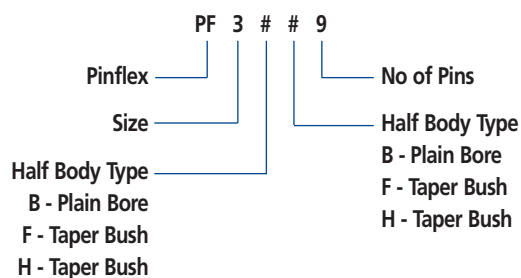
Max angular misalignment 0.25°

Disc Brake Drum version also available - consult Renold for details.

Max axial misalignment 0.13mm

## Pinflex

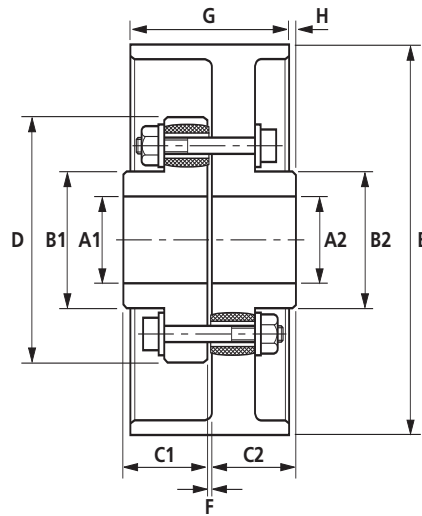
### Ordering Code



### Component Spares

Coupling Size	Half Body Pilot Bored		Half Body F Type		Half Body H Type		Pin and Buffer Set		Coupling Size
	Catalogue Number	Product Number	Catalogue Number	Product Number	Catalogue Number	Product Number	Product Number	Number Per Set	
PF1	PF1 B	8001042	PF1 F	8001042/77	PF1 H	8001042/88	800 0008	3	PF1
PF2	PF2 B	8002050	PF2 F	8002050/77	PF2 H	8002050/88	800 0010	3	PF2
PF3	PF3 B	8003060	PF3 F	8003060/77	PF3 H	8003060/88	800 0010	3	PF3
PF4	PF4 B	8004075	PF4 F	8004075/77	PF4 H	8004075/88	800 0012	1	PF4
PF5	PF5 B	8005090	PF5 F	8005090/77	PF5 H	8005090/88	800 0012	1	PF5
PF6	PF6 B	8006110	PF6 F	8006110/77	PF6 H	8006110/88	800 0016	1	PF6
PF7	PF7 B	8007130	PF7 F	8007130/77	PF7 H	8007130/88	800 0016	1	PF7
PF8	PF8 B	8008150	PF8 F	8008150/77	PF8 H	8008150/88	800 0020	1	PF8
PF9	PF9 B	8009240	N/A	N/A	N/A	N/A	800 0020	1	PF9

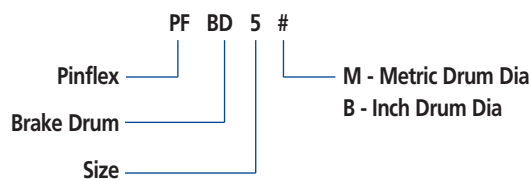
## Pinflex Brakedrum Couplings



Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max rpm	Bore		Drum Dimensions		
				A1 Max mm	A2 Max mm	Dia E mm	Width G mm	Dia E inch
PFBD1 #	8.1	774	3600	50	45	160	92	6
PFBD2 #	14.35	1370	2850	55	50	200	105	8
PFBD3 #	16.96	1620	2300	72	60	250	124	10
PFBD4 #	33.29	3179	1900	80	75	315	140	12
PFBD5 #	55.76	5325	1400	110	90	400	184	16
PFBD6 #	98.8	9435	1400	130	110	400	184	16
PFBD7 #	148.7	14200	1100	150	130	500	241	20
PFBD8 #	258.8	24714	900	175	150	630	267	24

Coupling Size	Dimensions									No. of Pins per cplg.	Pin & Buffer Set	
	B1 mm	B2 mm	C1 mm	C2 mm	D mm	F mm	H mm	WR <sup>2</sup> kg m <sup>2</sup>	Mass kg		Part No.	No. Per Set
PFBD1 #	70	70	44	44	125	4	-	0.0277	8.7	12	PFA	3
PFBD2 #	80	80	50	50	145	5	-	0.0696	14.3	12	PFB	3
PFBD3 #	100	100	60	60	165	5	-	0.1801	24.2	12	PFB	3
PFBD4 #	113	113	75	75	195	6	-	0.5487	49.0	12	PFC	1
PFBD5 #	150	150	90	90	235	6	-	1.6548	82.2	16	PFC	1
PFBD6 #	180	180	110	110	290	7	22	2.0706	114.1	12	PFD	1
PFBD7 #	210	210	130	130	320	7	13	5.2192	199.7	16	PFD	1
PFBD8 #	245	245	150	150	380	7	20	13.566	303.4	16	PFE	1

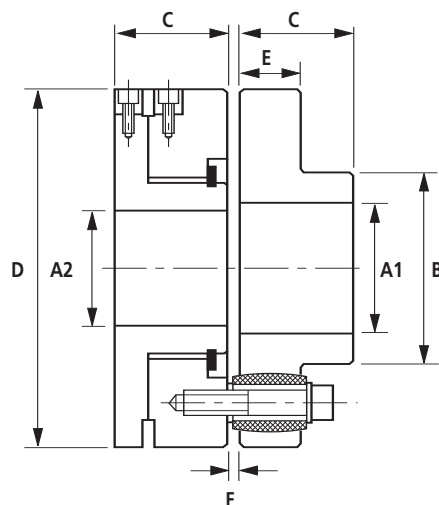
### Ordering Code



Disc Brake version also available - consult Renold for details.

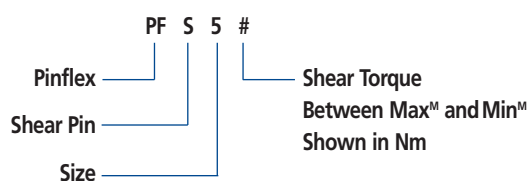


## Pinflex Shearpin Couplings



Coupling Size	Nominal Torque Nm	Shear Torque		Speed Max rpm	Bore A1		Bore A2		Dimensions					No. of Pins	
		Min Nm	Max Nm		Max mm	Min mm	Max mm	Min mm	B mm	C mm	D mm	E mm	F mm		Mass kg
PFS1 #	387	194	774	6800	50	-	40	-	70	44	125	20	4	6.3	6
PFS2 #	685	220	1370	5900	55	-	47	-	80	50	145	25	5	10.1	6
PFS3 #	810	350	1620	5200	72	-	57	-	100	60	165	25	5	15.3	6
PFS4 #	1590	425	3180	4400	80	-	63	-	113	75	195	35	6	27.3	6
PFS5 #	2662	520	5324	3600	110	-	93	-	150	89	235	35	6	47.3	8
PFS6 #	4717	1100	9434	2900	130	55	107	55	180	110	290	50	7	89.8	6
PFS7 #	7100	2750	14200	2600	150	65	120	65	210	130	320	50	7	129	8
PFS8 #	12357	5900	24714	2200	175	75	147	75	245	150	380	60	7	212	8
PFS9 #	16255	8130	32510	1700	260	75	200	75	355	220	490	60	7	513	8

### Ordering Code



Select coupling based on nominal torque using service factors from page 14.  
 Then select required shear torque from table above.

## Crownpin



**An established pin/buffer coupling, offering extended power capacity where the demand for long life and simplicity of construction make it suitable for working in arduous conditions.**

### **Coupling Capacity:**

- Maximum power @ 100RPM 2611kW
- Maximum torque 249400Nm

### **Features & Benefits:**

- Heavy duty coupling suitable for shock load conditions.
- Neoprene rubber buffers for robust flexibility.
- Torsionally flexible - shock absorbing, extending machine life.
- Maintenance free - minimum number of wearing parts.
- Misalignment capabilities allowing flexibility installation.

### **Standard Range Comprise:**

- Shaft to Shaft
- Shear Pin
- Brake Drum

### **Applications:**

- Conveyors
- Cranes
- Fans
- Leisure Rides
- Lifts
- Pumps
- Screens
- Washers
- General Industrial Applications

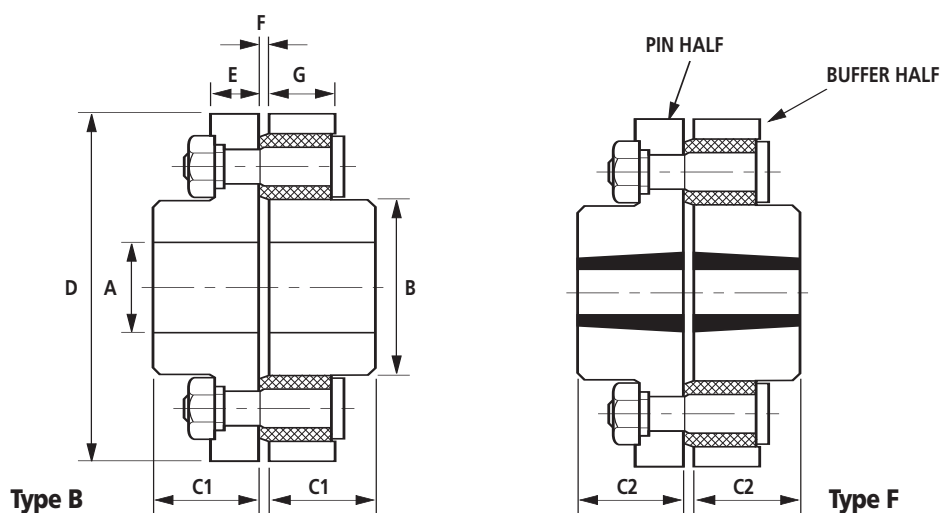
### **Construction Details:**

Cast Iron Half Bodies

Neoprene Buffers: Temp range - 30° to + 95°c

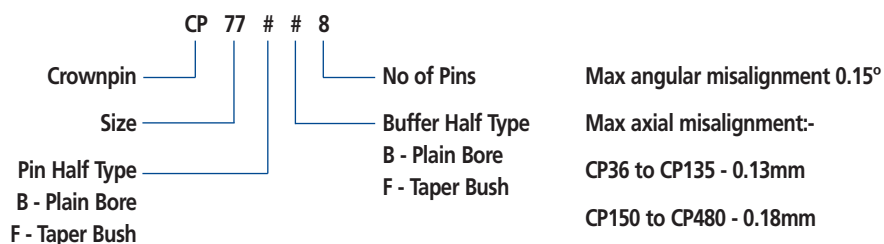
***Crownpin - The Reliable Solution***

## Crownpin



Coupling Number	Power /100rpm Kw	Torque Nominal Nm	Speed Max rpm	Type B		Type F		Dimensions								No of Pins	Spare Parts Code	
				Bore A		Bush Size	Bore		B	C1	C2	D	E	F	G			Mass kg
				Max	Min		Max	Min	mm	mm	mm	mm	mm	mm	mm			
CP36BB3	0.37	35	6210	20	0	N/A	-	-	37	32	-	94	15	2.4	23	1.9	3	A
CP48BB4	0.74	71	4760	35	0	N/A	-	-	62	38	-	122	15	2.4	23	3.7	4	A
CP48BB8	1.48	142	4760	35	0	N/A	-	-	62	38	-	122	15	2.4	23	3.7	8	A
CP57# #4	1.85	177	3980	45	0	TB1215	32	11	73	45	38	146	19	2.4	29	6.6	4	B
CP57# #8	3.7	354	3980	45	0	TB1215	32	11	73	45	38	146	19	2.4	29	6.6	8	B
CP65# #8	5.21	497	3520	50	0	TB1615	42	14	83	51	38	165	22	3.2	35	10	8	C
CP77# #8	7.45	711	2950	65	0	TB2017	50	18	103	60	45	197	22	3.2	35	15	8	D
CP91# #4	10.44	997	2510	75	38	TB2525	60	19	121	70	64	232	29	4.8	46	30	4	E
CP91# #8	20.9	1995	2510	75	38	TB2525	60	19	121	70	64	232	29	4.8	46	30	8	E
CP106# #10	32.8	3134	2510	90	38	TB3030	75	35	156	83	76	270	29	4.8	46	45	10	E
CP120# #8	41.8	3990	1900	95	45	TB3535	90	35	165	95	89	305	33	6.4	54	63	8	F
CP135# #10	62.7	5984	1690	115	50	TB4040	100	40	203	108	102	343	33	6.4	54	90	10	F
CP150BB10	97	9262	1520	120	60	N/A	-	-	222	121	-	381	40	6.4	65	130	10	G
CP165BB10	112	10690	1380	140	65	N/A	-	-	254	133	-	419	40	6.4	65	168	10	G
CP180BB10	164	15660	1270	145	70	N/A	-	-	267	146	-	457	48	7.9	71	218	10	H
CP210BB12	246	23490	1090	150	70	N/A	-	-	279	172	-	533	48	7.9	71	295	12	H
CP240BB12	373	35620	950	180	85	N/A	-	-	330	197	-	609	56	8.7	83	450	12	K
CP270BB14	496	46990	840	200	85	N/A	-	-	368	216	-	686	56	8.7	83	587	14	K
CP300BB14	746	71240	760	230	95	N/A	-	-	406	229	-	762	67	9.5	102	825	14	L
CP360BB18	1194	114000	630	250	95	N/A	-	-	470	254	-	914	67	9.5	102	1160	18	L
CP420BB16	1716	163900	540	280	110	N/A	-	-	482	279	-	1067	83	12.7	127	1700	16	M
CP480BB20	2611	249400	470	300	110	N/A	-	-	533	305	-	1220	83	12.7	127	2250	20	M

### Ordering Code



Other pin configurations are available - consult Renold.

**Crownpin (continued)****Component Spares**

Coupling Number	Product Number	Pin Half Body		Buffer Half Body		Pin & Nut	Neoprene Buffer
		Pilot Bored	Taper Bored	Pilot Bored	Taper Bored		
CP36BB3	7032303	7032303/1	N/A	7032303/2	N/A	7030003/60	7030003/3
CP48BB4	7032105	7032105/1	N/A	7032105/2	N/A	7030003/60	7030003/3
CP48BB8	7032305	7032305/1	N/A	7032305/2	N/A	7030003/60	7030003/3
CP57##4	7032106	7032106/1	7032106/177	7032106/2	7032106/277	7030006/60	7030006/3
CP57##8	7032306	7032306/1	7032306/177	7032306/2	7032306/277	7030006/60	7030006/3
CP65##8	7032307	7032307/1	7032307/177	7032307/2	7032307/277	7030007/60	7030007/3
CP77##8	7032308	7032308/1	7032308/177	7032308/2	7032308/277	7030008/60	7030008/3
CP91##4	7032109	7032109/1	7032109/177	7032109/2	7032109/277	7030009/60	7030009/3
CP91##8	7032309	7032309/1	7032309/177	7032309/2	7032309/277	7030009/60	7030009/3
CP106##10	7032310	7032310/1	7032310/177	7032310/2	7032310/277	7030009/60	7030009/3
CP120##8	7032312	7032312/1	7032312/177	7032312/2	7032312/277	7030012/60	7030012/3
CP135##10	7032313	7032313/1	7032313/177	7032313/2	7032313/277	7030012/60	7030012/3
CP150BB10	7032315	7032315/1	N/A	7032315/2	N/A	7030015/60	7030015/3
CP165BB10	7032316	7032316/1	N/A	7032316/2	N/A	7030015/60	7030015/3
CP180BB10	7032318	7032318/1	N/A	7032318/2	N/A	7030018/60	7030018/3
CP210BB12	7032321	7032321/1	N/A	7032321/2	N/A	7030018/60	7030018/3
CP240BB12	7032324	7032324/1	N/A	7032324/2	N/A	7030024/60	7030024/3
CP270BB14	7032327	7032327/1	N/A	7032327/2	N/A	7030024/60	7030024/3
CP300BB14	7032330	7032330/1	N/A	7032330/2	N/A	7030030/60	7030030/3
CP360BB18	7032336	7032336/1	N/A	7032336/2	N/A	7030030/60	7030030/3
CP420BB16	7032342	7032342/1	N/A	7032342/2	N/A	7030042/60	7030042/3
CP480BB20	7032348	7032348/1	N/A	7032348/2	N/A	7030042/60	7030042/3

## Tyreflex Resilient Shaft Couplings



**A range of highly flexible couplings offering excellent misalignment capacity and suitable to absorb both shock loads and vibrations.**

### Coupling Capacity:

- Maximum power @ 100RPM    65.8 kW
- Maximum torque                    6270 Nm

### Features & Benefits:

- High misalignment capabilities - high flexibility.
- Shock absorbing - extending machine life.
- Maintenance free - minimum number of wearing parts.
- Fire retardent, anti-static elements available for use in a flameproof environment.
- Interchangeability means no re-engineering.
- Pump spacer option for easy pump maintenance.
- Taper bush bores available for ease of replacement.

### Standard Range Comprise:

- Shaft to Shaft
- Pump Spacer Type

### Applications:

- Compressors
- Generator Sets
- Pumps
- Roller Table Drives
- General Industrial Applications

### Construction Details:

Steel or S.G. Iron Half Bodies

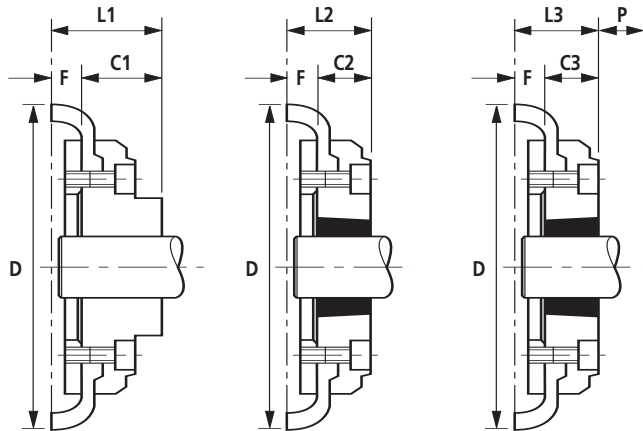
Rubber Tyres: Temp Range -50°C to + 50°C

Chloroprene Tyres: Temp Range -15°C to + 70°C

***Tyreflex - The Interchangeable Resilient Solution.***

## Tyreflex

Sizes TY40 to TY60

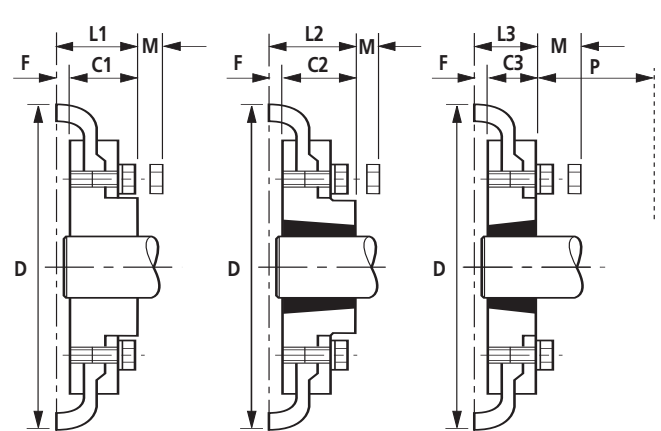


Type B

Type F

Type H

Sizes TY70 to TY180



Type B

Type F

Type H

Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max rpm	Type B		Type F		Type H		Max. Misalignment		End Float mm	Torsional Stiffness Nm/°		
				Bore		Bore		Bore		Offset mm	Angular deg				
				Max	Min	Max	Min	Max	Min						
TY40 ##	0.26	25	4500	30	12	TB1008	25	9	TB1008	25	9	1.1	4	±1.3	6
TY50 ##	0.69	66	4500	38	15	TB1210	32	11	TB1210	32	11	1.3	4	±1.7	12.5
TY60 ##	1.33	127	4000	45	18	TB1610	42	14	TB1610	42	14	1.6	4	±2.0	32
TY70 ##	2.62	250	3600	50	22	TB2012	50	14	TB1610	42	14	1.9	4	±2.3	60
TY80 ##	3.93	375	3100	60	25	TB2517	60	16	TB2012	50	14	2.1	4	±2.6	63
TY90 ##	5.24	500	3000	70	28	TB2517	60	16	TB2517	60	16	2.4	4	±3.0	91
TY100 ##	7.07	675	2600	80	32	TB3020	75	25	TB2517	60	16	2.6	4	±3.3	126
TY110 ##	9.2	875	2300	95	30	TB3020	75	25	TB3020	75	25	2.9	4	±3.7	178
TY120 ##	13.9	1300	2050	110	38	TB3525	100	35	TB3020	75	25	3.2	4	±4.0	296
TY140 ##	24.3	2320	1800	130	75	TB3525	100	35	TB3525	100	35	3.7	4	±4.6	470
TY160 ##	39.4	3770	1600	140	85	TB4030	115	40	TB4030	115	40	4.2	4	±5.3	776
TY180 ##	65.8	6270	1500	150	85	TB4535	125	55	TB4535	125	55	4.8	4	±6.0	1370

Coupling Size	Dimensions										Type B	Type F	Type H
	C1 mm	C2 mm	C3 mm	D mm	F mm	L1 mm	L2 mm	L3 mm	M mm	P mm	Mass* kg	Mass* kg	Mass* kg
TY40 ##	22	22	22	104	11	33.5	33.5	33.5	N/A	29	1.05	1.05	1.05
TY50 ##	32	25	25	133	12.5	45	38	38	N/A	38	1.5	1.5	1.5
TY60 ##	38	25	25	165	16.5	55	42	42	N/A	38	2.35	2.35	2.35
TY70 ##	35	32	25	187	11.5	47	44	42	13	38	3.45	3.45	3.45
TY80 ##	42	45	32	211	12.5	55	58	45	16	42	5	5	5
TY90 ##	49	45	45	235	13.5	63	59	59	16	48	7.25	7.25	7.25
TY100 ##	56	51	45	254	13.5	70	65	59	16	48	10	10	10
TY110 ##	63	51	51	279	12.5	76	63.5	63.5	16	55	12.5	11.7	11.7
TY120 ##	70	65	51	314	14.5	84.5	78.5	65.5	16	67	16.9	16.5	15.9
TY140 ##	94	65	65	359	16	110.5	81	81	17	67	22.2	22.3	22.3
TY160 ##	102	77	77	402	15	117	92	92	19	80	35.8	33.5	32.5
TY180 ##	114	89	89	470	23	137	112	112	19	89	49.1	42.2	42.2

NOTE: M is distance by which clamping screws need to be withdrawn to release tyres.

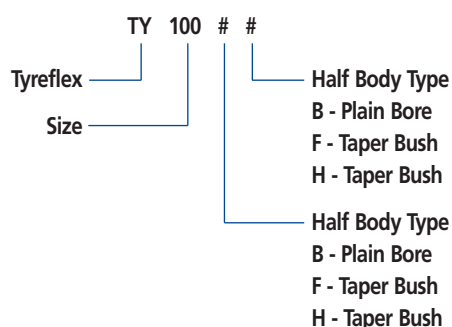
P is wrench clearance for taper bush screws when large end is outboard Type H.

\* Mass is for single hub assembly and half tyre.

See Page 32 for ordering code.

## Tyreflex (continued)

### Ordering Code - Tyreflex



### Component Spares

Coupling Size	Tyre Flexible Element		Half Body Unbored Type B		Half Body Taper Bored Type F		Half Body Taper Bored Type H	
	Catalogue No.	Product No.	Catalogue No.	Product No.	Catalogue No.	Product No.	Catalogue No.	Product No.
TY40 # #	TY40	7131104/1	TY40 B	7131104/HB02	TY40 F	7131104/HB77	TY40 H	7131104/HB88
TY50 # #	TY50	7131105/1	TY50 B	7131105/HB02	TY50 F	7131105/HB77	TY50 H	7131105/HB88
TY60 # #	TY60	7131106/1	TY60 B	7131106/HB02	TY60 F	7131106/HB77	TY60 H	7131106/HB88
TY70 # #	TY70	7132107/1	TY70 B	7132107/HB02	TY70 F	713107/HB77	TY70 H	7132107/HB88
TY80 # #	TY80	7132108/1	TY80 B	7132108/HB02	TY80 F	7132108/HB77	TY80 H	7132108/HB88
TY90 # #	TY90	7132109/1	TY90 B	7132109/HB02	TY90 F	7132109/HB77	TY90 H	7132109/HB88
TY100 # #	TY100	7132110/1	TY100 B	7132110/HB02	TY100 F	7132110/HB77	TY100 H	7132110/HB88
TY110 # #	TY110	7132111/1	TY110 B	7132111/HB02	TY110 F	7132111/HB77	TY110 H	7132111/HB88
TY120 # #	TY120	7132112/1	TY120 B	7132112/HB02	TY120 F	7132112/HB77	TY120 H	7132112/HB88
TY140 # #	TY140	7132114/1	TY140 B	7132114/HB02	TY140 F	7132114/HB77	TY140 H	7132114/HB88
TY160 # #	TY160	7132116/1	TY160 B	7132116/HB02	TY160 F	7132116/HB77	TY160 H	7132116/HB88
TY180 # #	TY180	7132118/1	TY180 B	7132118/HB02	TY180 F	7132118/HB77	TY180 H	7132118/HB88

## Fluid Coupling Air Clutch & Freewheel Products



HYDRASTART

**HYDRASTART** - The Soft Start Solution  
Fluid soft start couplings available in many sizes and types up to 700KW (950HP) capacity.

Max kw @ 1500RPM 600

- Flexible couplings and vee pulley designs as standard for design flexibility
- Soft start allowing the motor to accelerate unloaded
- Reduces motor size and drive package cost
- Delay fill version – extending acceleration time and further reducing start-up torque

**SPRAG CLUTCHES** - The Precise Solution

Max Torque 759300 NM

- Backstop types preventing drive reversals
- Over running and index types
- No backlash giving positive action
- Interchangeability needs no re-engineering

**SPRAG CLUTCH COUPLINGS**

Two versions available using Pinflex and Gearflex couplings for total flexibility on shaft to shaft transmission drives.

Max Torque 9660 NM

- SO series clutch combined with Pinflex coupling allowing angular, parallel and axial misalignment
- Absorbs vibration and shock loads
- SO series clutch with two flexible half Gearflex couplings forming a short cardan shaft accommodating parallel and angular misalignment
- Allows larger shaft sizes to be used

**AIR CLUTCHES**

- Constricting and expanding types activated by standard factory air supply
- Clutch or brake types available for flexible design choice
- Air flow control allowing reaction time to be adjusted thus protecting all machinery parts

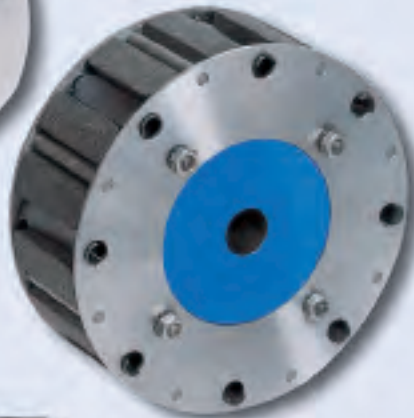
**TRAPPED ROLLER FREEWHEELS**

Available in a number of design types suitable for all backstop, indexing and over-running applications.

- Totally interchangeable. Needs no re-engineering
- Backstop types preventing drive reversals



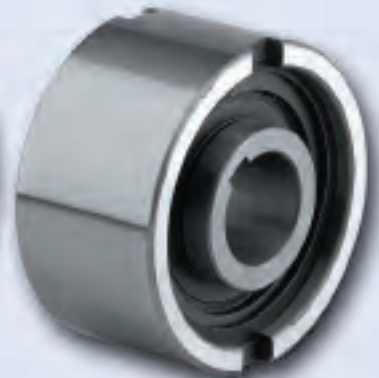
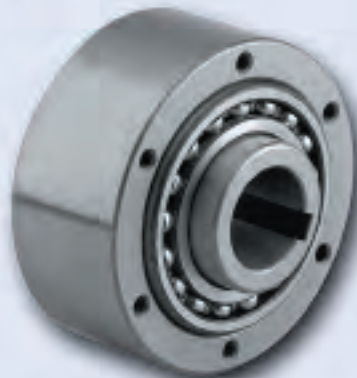
SPRAG CLUTCHES



AIR CLUTCH



GEARFLEX / SPRAG CLUTCH COUPLING



TRAPPED ROLLER FREEWHEELS



## Discflex



**A general purpose fail safe, torsionally flexible coupling, offering the option of either urethane or reinforced rubber disc, as the flexible element.**

### **Coupling Capacity:**

- Maximum power @ 100RPM    45kW
- Maximum torque                    4298Nm

### **Features & Benefits:**

- Compact design, dimensionally small yet high power capacity.
- Torsionally flexible - shock absorbing, extending machine life.
- Maintenance free - minimum number of wearing parts.
- Misalignment capabilities allowing flexibility installation.
- Alternative flexible elements available for wide design choice.
- Optional fire retardent anti-static elements for use in flameproof environment.
- Taper bush bores available for ease of maintenance.

### **Standard Range Comprise:**

- Shaft to Shaft

### **Applications:**

- Bottling Machines
- Compressors
- Mixers
- Pumps
- Screens
- General Industrial Applications

### **Construction Details:**

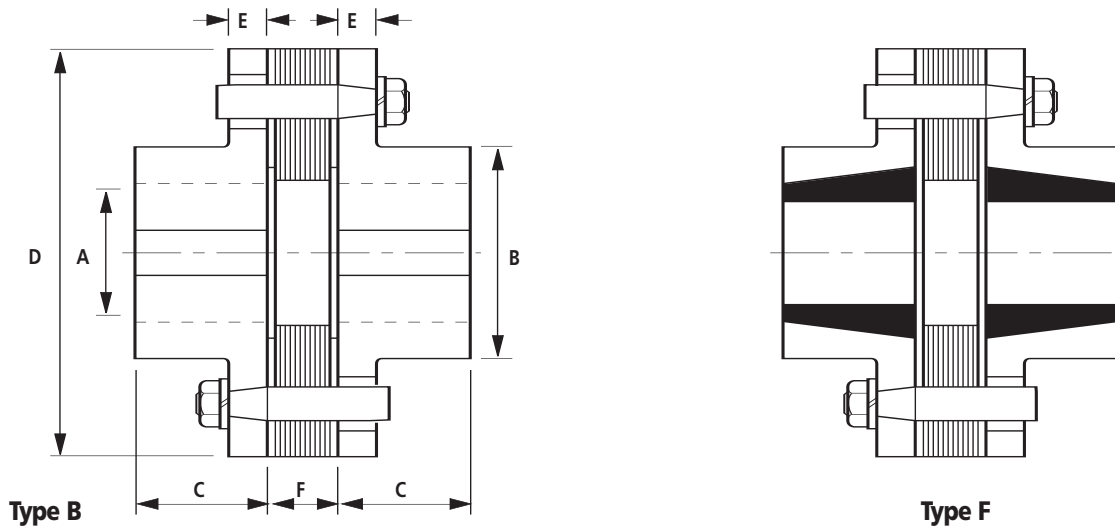
Cast Iron Half Bodies

Urethane Disc - Temp Range -40 + 80°C

Rubber Reinforced Disc - Temp Range -40 + 90°C

***Discflex - The Positive Choice***

## Discflex



Coupling Number	Power /100rpm Kw	Torque Nominal Nm	Speed Max* rpm	Type B		Type F		Dimensions						End Float mm	
				Bore		Bush Size	Bore		B mm	C mm	D mm	E mm	F mm		Mass kg
				Max	Min		Max	Min							
D41# # N #	0.75	72	2900	32	12	TB1008	25	9	58	25	104	11	16	2.1	1.8
D52# # N #	1.5	143	2250	42	19	TB1215	32	11	72	41	133	13	22	4.9	2.5
D52# # S #	2.25	215											26	5.0	2.5
D52# # W #	3	287											31	5.1	2.5
D71# # N #	3.75	358	1650	60	28	TB2017	50	18	102	48	181	16	23	11.0	3
D71# # S #	5.25	501											27	11.1	3
D71# # W #	7.5	716											32	11.2	3
D89# # N #	9	860	1300	75	32	TB2525	60	19	121	70	225	18	28	20.8	3.8
D89# # S #	12	1146											40	21.0	3.8
D89# # W #	15	1433											47	21.7	3.8
D108# # NR	19	1791	1050	95	38	TB3030	75	35	155	83	274	22	47	40.0	4.6
D108# # SR	23	2149											51	40.0	4.6
D108# # WR	26	2507											63	41.0	4.6
D127# # NR	30	2865	900	110	55	TB3535	90	35	185	95	324	25	53	65.0	5.3
D127# # SR	38	3581											61	66.0	5.3
D127# # WR	45	4298											73	67.0	5.3

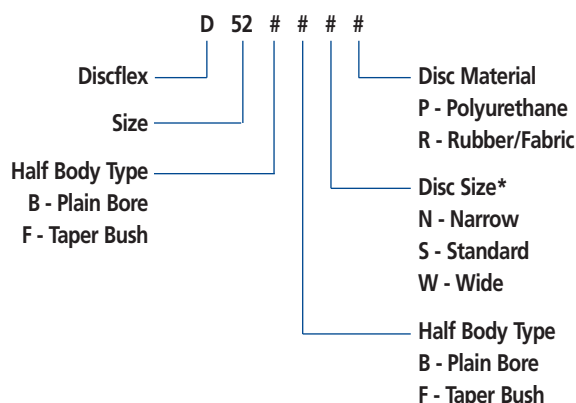
\* Normal maximum speeds with 1° max. angular malalignment, above these speeds consult our Sales Technical Staff.

Max angular misalignment 1°

Max axial misalignment 0.5mm

## Discflex

### Ordering Code



\* Disc size depending on torque transmitted.

### Component Spares

Coupling Number	Product No. 'BB' Type	Product No. 'FF' Type	Polyurethane Disc	Rubber/Fabric Disc	Pin Assembly	Half Body Pilot Bored	Half Body Taper Bored
D41 ## NP	644763	644763/77	644733	-	644204	644205	644205/77
D41 ## NR	647263	647263/77	-	647233	644204	644205	644205/77
D52 ## NP	644766	644766/77	644736	-	644207	644208	644208/77
D52 ## NR	647266	647266/77	-	647236	644207	644208	644208/77
D52 ## SP	644767	644767/77	644737	-	644207	644208	644208/77
D52 ## SR	647267	647267/77	-	647237	644207	644208	644208/77
D52 ## WP	644768	644768/77	644738	-	644207	644208	644208/77
D52 ## WR	647268	647268/77	-	647238	644207	644208	644208/77
D71 ## NP	644769	644769/77	644739	-	644210	644211	644211/77
D71 ## NR	647269	647269/77	-	647239	644210	644211	644211/77
D71 ## SP	644770	644770/77	644740	-	644210	644211	644211/77
D71 ## SR	647270	647270/77	-	647240	644210	644211	644211/77
D71 ## WP	644771	644771/77	644741	-	644210	644211	644211/77
D71 ## WR	647271	647271/77	-	647241	644210	644211	644211/77
D89 ## NP	644772	644772/77	644742	-	644213	644214	644214/77
D89 ## NR	647272	647272/77	-	647242	644213	644214	644214/77
D89 ## SP	644773	644773/77	644743	-	644213	644214	644214/77
D89 ## SR	647273	647273/77	-	647243	644213	644214	644214/77
D89 ## WP	644774	644774/77	644744	-	644213	644214	644214/77
D89 ## WR	647274	647274/77	-	647244	644213	644214	644214/77
D108 ## NR	647275	647275/77	-	647245	644216	644217	644217/77
D108 ## SR	647276	647276/77	-	647246	644216	644217	644217/77
D108 ## WR	647277	647277/77	-	647247	644216	644217	644217/77
D127 ## NR	647278	647278/77	-	647248	644219	644220	644220/77
D127 ## SR	647279	647279/77	-	647249	644219	644220	644220/77
D127 ## WR	647280	647280/77	-	647250	644219	644220	644220/77

## 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 & 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.

### **Standard Range Comprise:**

- Taper Bush or Parallel Bored

### **Applications:**

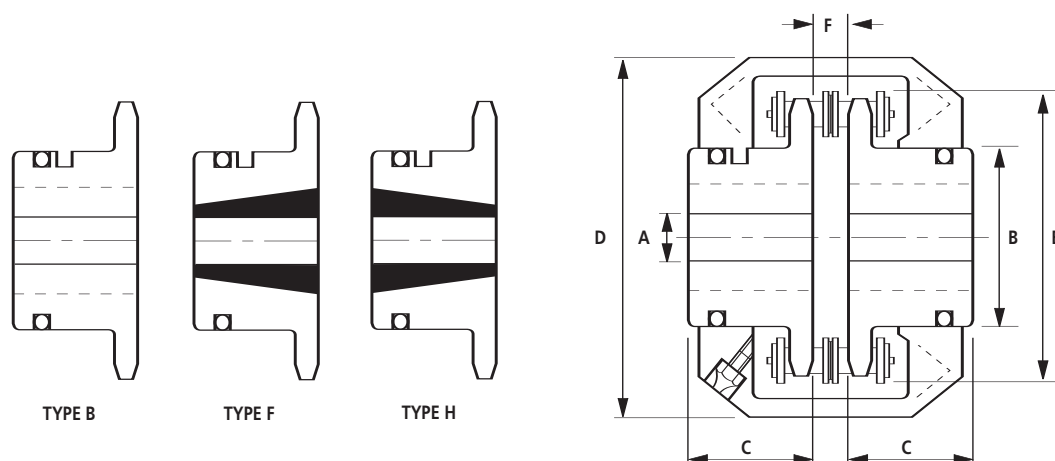
- Fans
- Feeders
- Kiln Dryers
- Line Shafts
- Pump Drives

### **Construction Details:**

Hardened Steel Sprockets  
Renold Duplex Chain  
Moulded Cover

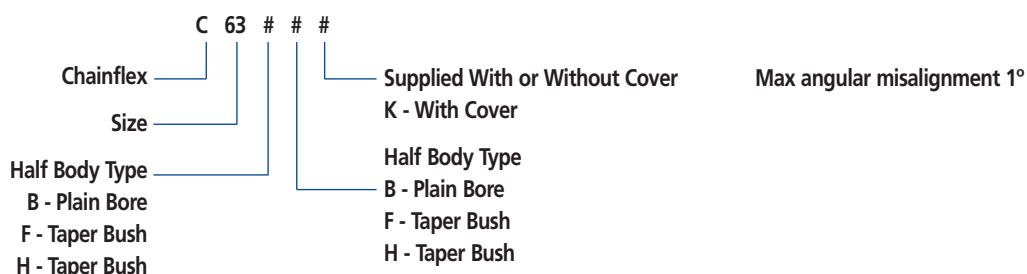
## ***Chainflex - The Flexible Solution***

## Chainflex Flexible Coupling



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

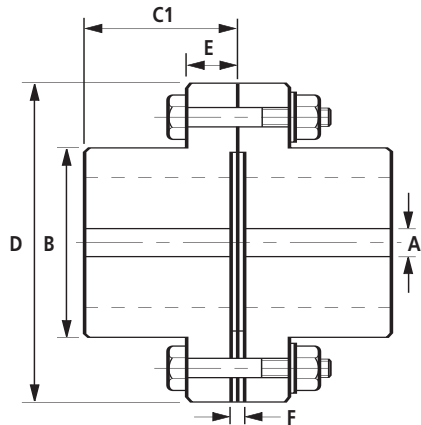
### Ordering Code



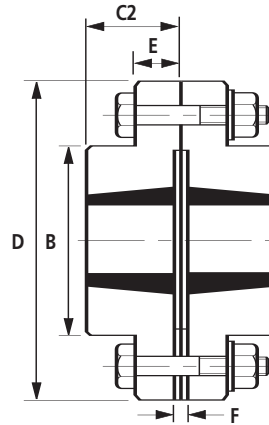
### Component Spares

Coupling Number	With Cover		Without Cover		Cover	Half Body Pilot Bored	Half Body Taper Bored F Type	Half Body Taper Bored H Type	Chain With Connectors
	Product Number	Coupling Number	Product Number	Coupling 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	

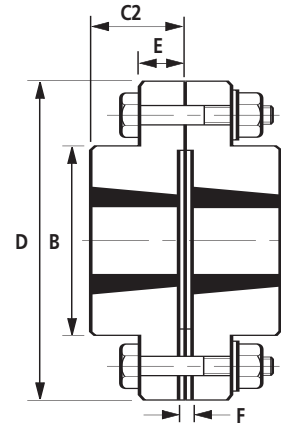
## Rigid



Type BB



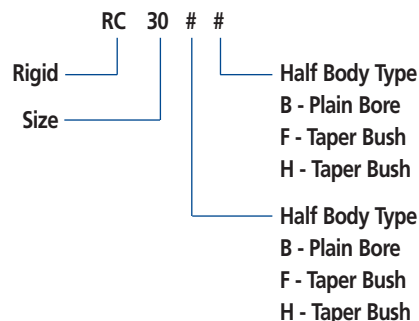
Type FF



Type HF

Coupling Size	B Type		F & H Type*			Dimensions						B Type	F & H Type
	Bore Dia. A		Bush Size	Bore		B mm	C1 mm	C2 mm	D mm	E mm	F mm	Weight kg	Weight kg
	Max	Min		Max	Min								
RC10 # #	54	14	TB1615	42	14	76	42	42	116	14	5	5.4	2.0
RC15 # #	70	20	TB2012	50	14	98	49	35	152	19	5	9.1	5.3
RC20 # #	90	27	TB2517	60	16	124	62	47	178	19	5	19.4	8.3
RC25 # #	105	27	TB3030	75	35	148	77	79	213	22	5	32.6	16.6
RC30 # #	125	39	TB3535	90	35	173	91	91	240	22	5	41.3	22.7
RC35 # #	145	39	TB4040	100	40	201	106	106	279	29	5	66.2	37.1
RC40 # #	170	55	TB4545	110	55	233	121	121	318	29	10	97.1	47.8
RC45 # #	190	55	TB5050	125	70	262	135	135	346	29	10	132	77.05
RC50BB	210	55	N/A	-	-	294	153	-	389	38	10	194	-
RC55BB	230	55	N/A	-	-	324	168	-	425	38	10	253	-
RC60BB	250	55	N/A	-	-	349	188	-	457	25	13	319	-
RC70BB	290	55	N/A	-	-	406	229	-	527	29	16	501	-

### Ordering Code



Larger sizes are available.

\* NOTE: Torque transmitted by F & H types is limited by the torque capacity of the taper bush.

NOTE: When connecting vertical shafts use type BB with keep plates or type FF. Type HF must not be used.

## Gearflex Flexible Coupling



**Heavy duty all metal couplings, giving maximum power capacity within minimum space envelope and excellent misalignment capacity.**

### Coupling Capacity:

- Maximum power @ 100RPM 50485kW
- Maximum torque 4747000Nm

### Features & Benefits:

- Heavy duty gear coupling for strength in application, combined with long life - strength and long life.
- AGMA standard - interchangeable and cost effective.
- Single and double engagement types available, suiting all applicational requirements.
- Crowned and barrelled teeth for optimum contact and long life.
- Mill motor, shear pin and telescopic designs to give design suitability for demanding applications.

### Construction Details:

- Steel half bodies and inner hubs.
- 'O' Ring sealing

### Range Options:

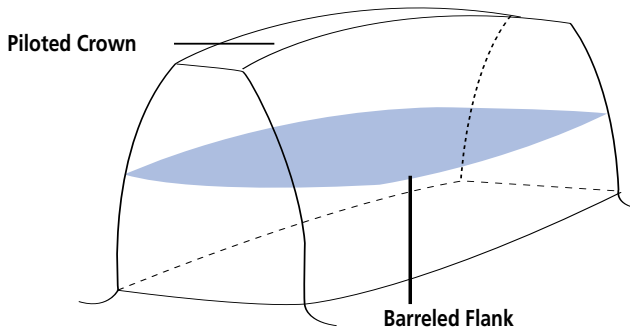
- Brake Disc/Drum
- Dis-engaging
- High Misalignment Up To 6°
- Long Hub
- M B Series
- Mill Motor
- Shear Pin
- Spindles
- Telescopic
- Torque Tube

### Applications:

- Crane drives
- Mining
- Steelworks
- General heavy industrial applications

***Gearflex - The High Torque Solution***

## Gearflex - Introduction



Designed to meet the demands of today's wide ranging applications and manufactured to Renold's high standards.

Renold Gearflex Couplings feature an increased tooth capacity from optimised design, providing maximised power capacity within a given space envelope.

Contact us for more information on how we can deliver a cost effective solution to your application.

**RENOLD** Clutches & Couplings have the design and manufacturing capability to engineer a shaft coupling to suit customers' special design application requirements.

Note: M B series are also readily available in all variants. For details contact Renold.

### Misalignment Capabilities:

#### Double Engagement

- Parallel Offset
- Angular
- Axial (End Float)

#### Single Engagement

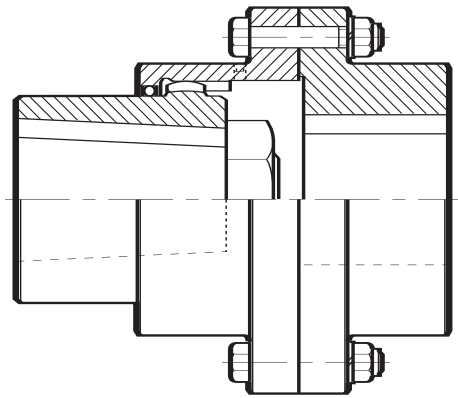
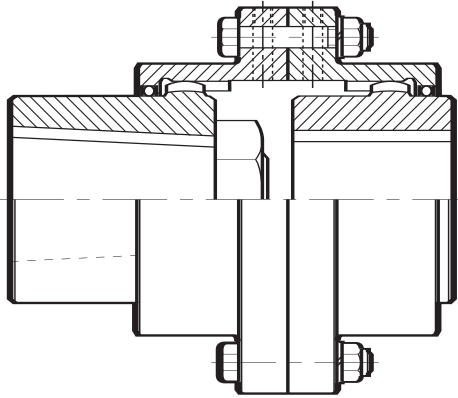
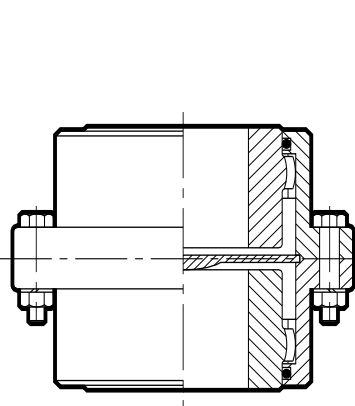
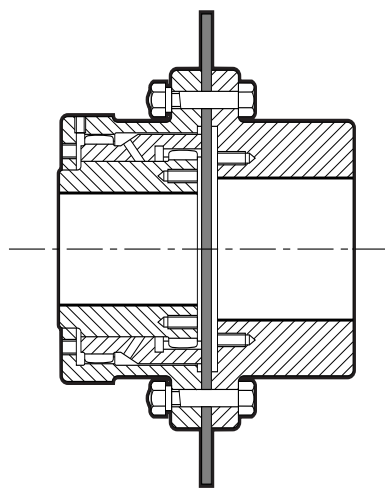
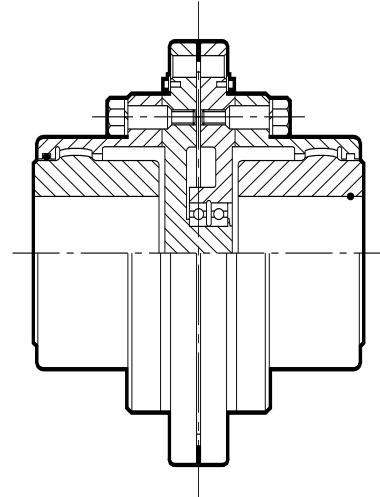
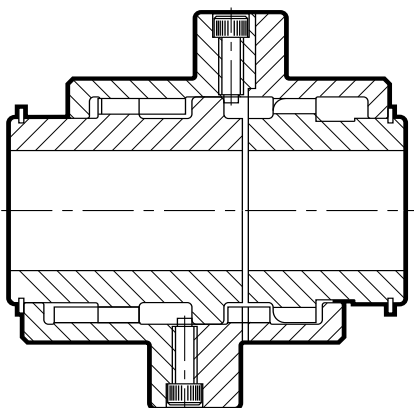
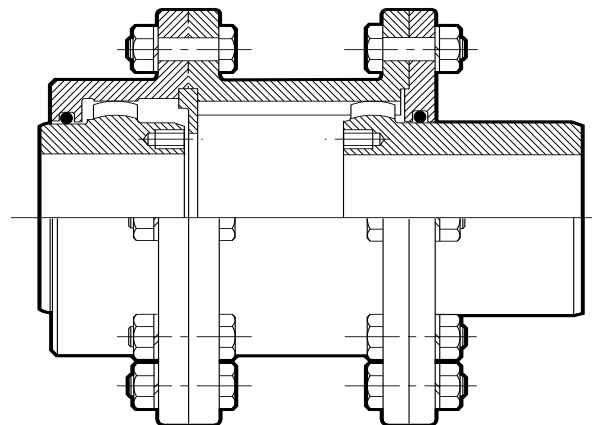
- Angular
- Axial (End Float)

When used in conjunction with a cardan shaft, two single engagement couplings will accept offset misalignment.

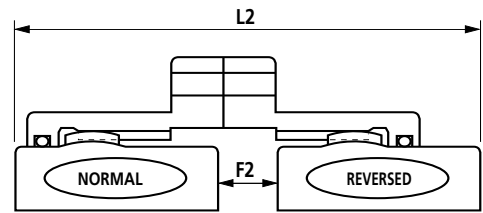
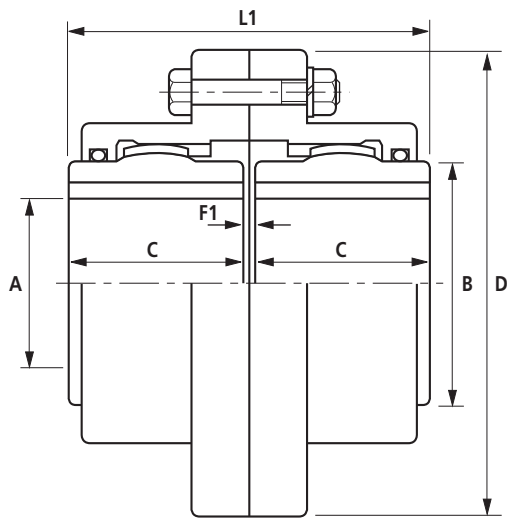
The amount will be dependant upon the cardan shaft length.



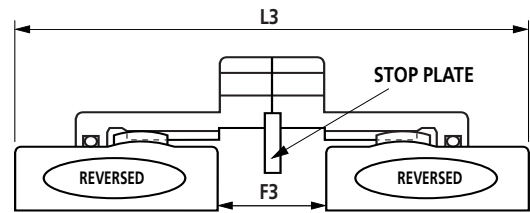


**Adapted and Bespoke Gear Couplings****Mill Motor Gear Couplings****Vertical Series****Disc Brake Gear Coupling****Shear Pin Gear Coupling****Disengaging Type Gear Coupling - Standard Series****Telescopic Type Gear Coupling - Standard Series**

## Gearflex DA



One hub reversed



Both hubs reversed

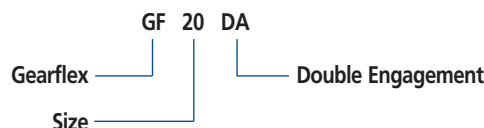
Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max** rpm	Bore A		Dimensions										Offset	
				Max* mm	Min mm	B mm	C mm	D mm	F1 mm	F2 mm	F3 mm	L1 mm	L2 mm	L3 mm	Mass kg	WR <sup>2</sup> kg m <sup>2</sup>	Max mm
GF10DA	14.9	1423	7100	46	14	60	43	116	3	5	6	89	90	92	4.2	0.006	1.2
GF15DA	28.2	2693	5400	57	20	76	49	152	3	8	13	102	106	111	7.7	0.020	1.5
GF20DA	48	4584	4800	78	27	102	62	178	3	14	25	127	138	149	15.0	0.044	2.0
GF25DA	77.6	7411	4250	90	27	117	77	213	5	12	19	159	166	173	25.4	0.105	2.3
GF30DA	128	12224	4000	110	39	143	91	240	5	23	42	187	206	224	36.7	0.188	3.0
GF35DA	196	18718	3600	127	39	165	106	279	6	27	48	219	240	260	60.8	0.436	3.5
GF40DA	312	29796	3290	145	55	191	121	318	6	32	57	248	273	298	90.7	0.822	4.0
GF45DA	431	41161	2920	165	55	216	135	346	8	37	65	278	306	335	122	1.305	4.5
GF50DA	578	55199	2630	185	55	241	153	389	8	50	92	314	356	398	178	2.550	5.3
GF55DA	857	81844	2320	205	55	267	175	425	8	53	98	359	404	449	235	3.780	6.0
GF60DA	1096	104668	2120	225	55	292	188	457	8	60	111	384	436	487	279	4.860	6.5
GF70DA	1640	156620	1830	260	55	343	221	527	9	71	133	451	513	575	443	10.350	7.8

Misalignment Angle (degrees)	Rating Factor
1.50	1.00
1.00	1.15
0.75	1.30
0.50	1.55
0.00	2.00

Catalogue ratings shown are nominal values at 1.50 degrees. For values at misalignments less than 1.50 degrees:- Multiply nominal catalogue values by factor in table left.

e.g.  
GF6DA at 1.50° = 104668 Nm  
at 0.75° = 104668 x 1.30:-  
GF6DA at 0.75° = 136068 Nm

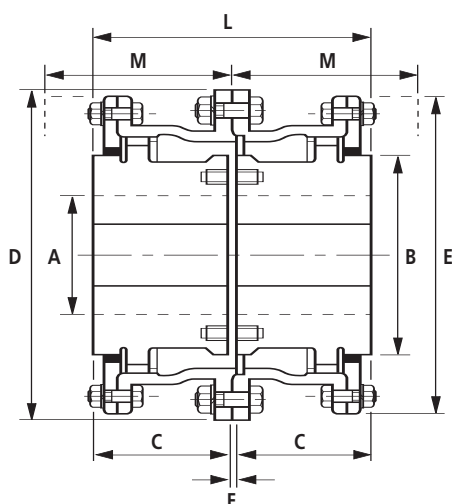
### Ordering Code



Long hub versions available. Contact Renold for details. See key stress calculations on Page 14.

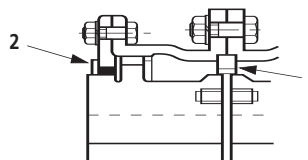
- \* Maximum Bore - The maximum bores shown are absolute maximums. Under normal circumstances the boss to bore ratio should not be less than 1.5 for standard applications. Consult Renold for overbore approval.
- \*\* Speed in excess of these shown may require additional balancing.
- \*\*\* Hubs may be reversed to increase DBSE (F2 + F3 above). If axial movement is allowed with both hubs reversed, a stop plate should be fitted to prevent hubs disengaging from outers.

## Gearflex HDB



### Options

1. Loose Spigot Ring
2. Bolt on End Plates

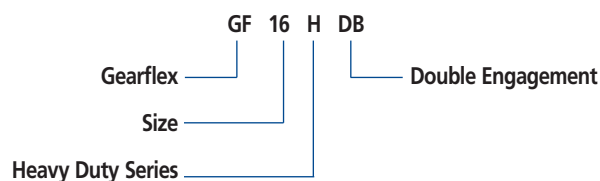


Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max** rpm	Bore A		Dimensions								Max Misalignment		End Float mm
				Max* mm	Min mm	B mm	C mm	D mm	E mm	F mm	L mm	M mm	Mass kg	Offset mm	Angular deg	
GF8HDB	1938	185120	2000	275	115	360	203	533	508	10	416	232	448	3.6	0.75	15.8
GF9HDB	2663	254280	1900	305	140	400	228	584	559	12	468	261	609	4.2	0.75	19.1
GF10HDB	2982	284800	1800	360	140	470	254	660	628	12	520	293	871	4.8	0.75	19.1
GF11HDB	3653	348900	1600	370	150	483	280	711	680	12	572	318	1070	5.3	0.75	19.1
GF12HDB	4846	462800	1400	410	150	533	305	768	737	14	624	343	1391	5.7	0.75	19.1
GF14HDB	7231	690600	1200	465	285	610	356	902	857	18	730	400	1767	6.9	0.75	19.1
GF16HDB	11183	1068000	1000	535	335	699	406	991	946	20	832	457	2560	8.4	0.75	19.1
GF18HDB	16031	1531000	700	605	360	787	457	1124	1073	25	939	520	3485	9.2	0.75	22.1
GF20HDB	22733	2171000	500	665	385	864	483	1230	1180	25	991	560	4463	9.6	0.75	22.1
GF22HDB	31309	2990000	400	720	410	940	483	1308	1257	25	991	560	5358	9.6	0.75	22.1
GF24HDB	37277	3560000	300	780	460	1016	483	1372	1321	25	991	560	6239	9.6	0.75	22.1
GF26HDB	49707	4747000	270	840	540	1092	559	1524	1486	28	1146	650	8985	10.6	0.75	22.1

Misalignment Angle (degrees)	Rating Factor
0.75	1.00
0.50	1.20
0.00	1.60

Catalogue ratings shown are nominal values at 0.75 degrees. For values at misalignments less than 0.75 degrees:- Multiply nominal catalogue values by factor in table left.

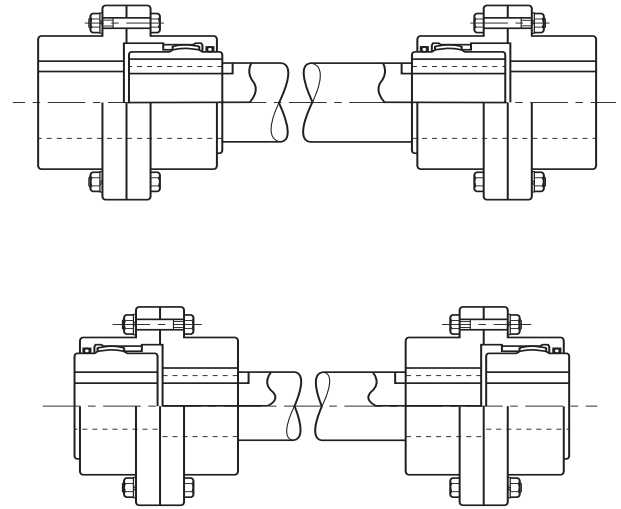
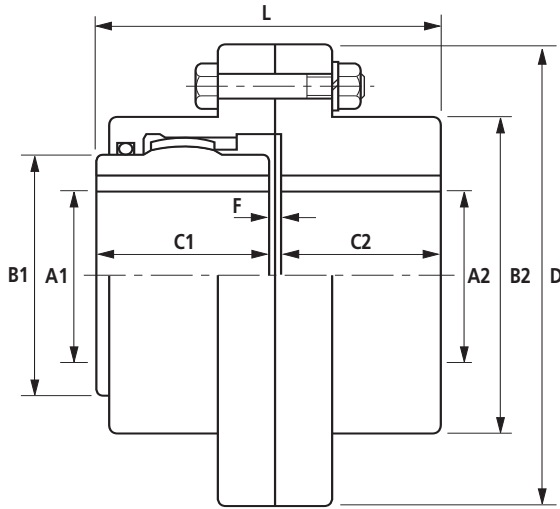
### Ordering Code



Long hub versions available contact Renold for details. See key stress calculations on page 14.

- \* Maximum Bore - The maximum bores shown are absolute maximums. Under normal circumstances the boss to bore ratio should not be less than 1.5 for standard applications. Consult Renold for overbore approval.
- \*\* Speed in excess of these shown may require additional balancing.

## Gearflex SA



Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max** rpm	Bore A1		Bore A2		Dimensions							Mass kg	WR <sup>2</sup> kg m <sup>2</sup>
				Max* mm	Min mm	Max mm	Min mm	B1 mm	B2 mm	C1 mm	C2 mm	D mm	F mm	L mm		
GF10SA	14.9	1423	7100	46	14	58	14	60	76	43	40	116	4	87	4.8	0.005
GF15SA	28.2	2693	5400	57	20	75	20	76	98	49	47	152	4	100	8.4	0.019
GF20SA	48	4584	4800	78	27	95	27	102	124	62	60	178	4	125	17.2	0.044
GF25SA	77.6	7411	4250	90	27	110	27	117	148	77	75	213	5	156	29.0	0.107
GF30SA	128	12224	4000	110	39	130	39	143	173	91	89	240	5	185	39.0	0.200
GF35SA	196	18718	3600	127	39	155	39	165	201	106	104	279	6	216	63.5	0.446
GF40SA	312	29796	3290	145	55	180	55	191	233	121	116	318	8	244	93.9	0.842
GF45SA	431	41161	2920	165	55	200	55	216	262	135	130	346	9	274	127	1.350
GF50SA	578	55199	2630	185	55	225	55	241	294	153	148	389	9	310	186	2.800
GF55SA	857	81844	2320	205	55	250	55	267	324	175	164	425	9	348	244	3.940
GF60SA	1096	104668	2120	225	55	265	55	292	349	188	182	457	10	380	299	5.130
GF70SA	1640	156620	1830	260	55	310	55	343	406	221	221	527	13	454	472	11.040

Misalignment Angle (degrees)	Rating Factor
1.50	1.00
1.00	1.15
0.75	1.30
0.50	1.55
0.00	2.00

Catalogue ratings shown are nominal values at 1.50 degrees.  
For values at misalignments less than 1.50 degrees:-  
Multiply nominal catalogue values by factor in table left.

### Ordering Code



Long hub versions available. Contact Renold for details. See key stress calculations on Page 14.

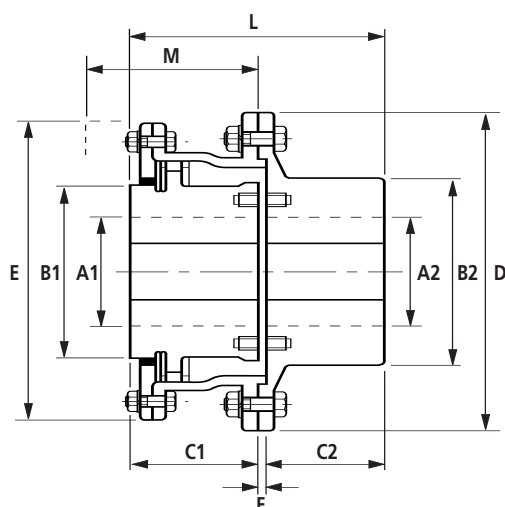
Renold can supply cardan shaft or torque tube assemblies.

Critical speeds must be checked, please contact Renold.

\* Maximum Bore - The maximum bores shown are absolute maximums. Under normal circumstances the boss to bore ratio should not be less than 1.5 for standard applications. Consult Renold for overbore approval.

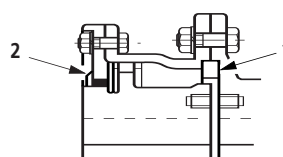
\*\* Speed in excess of these shown may require additional balancing.

## Gearflex HSB



### Options

1. Loose Spigot Ring
2. Bolt on End Plates

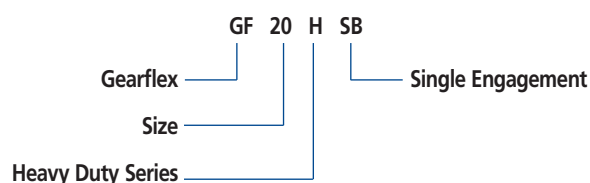


Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max** rpm	Bore A1		Bore A2		Dimensions										Max Angular Misalignment deg	End Float mm
				Max* mm	Min mm	Max mm	Min mm	B1 mm	B2 mm	C1 mm	C2 mm	D mm	E mm	F mm	L mm	M mm	Mass kg		
GF8HSB	1938	185120	2000	275	115	240	115	360	368	203	200	533	508	13	416	232	411	0.75	7.9
GF9HSB	2663	254280	1900	305	140	280	140	400	406	228	226	584	559	14	468	261	557	0.75	9.6
GF10HSB	2982	284800	1800	360	140	305	140	470	457	254	252	660	628	14	520	293	877	0.75	9.6
GF11HSB	3653	348900	1600	370	150	330	150	483	533	280	278	711	680	14	572	318	1051	0.75	9.6
GF12HSB	4846	462800	1400	410	150	356	150	533	584	305	302	768	737	16	623	343	1365	0.75	9.6
GF14HSB	7231	690600	1200	465	285	430	190	610	660	356	354	902	857	21	731	400	1504	0.75	9.6
GF16HSB	11183	1068000	1000	535	335	480	215	699	711	406	405	991	946	21	832	458	2184	0.75	9.6
GF18HSB	16031	1531000	700	605	360	560	255	787	864	457	456	1124	1073	27	940	521	2947	0.75	11
GF20HSB	22733	2171000	500	665	385	610	280	864	940	483	481	1230	1181	27	991	560	3717	0.75	11
GF22HSB	31309	2990000	400	720	410	635	300	940	965	483	481	1308	1257	27	991	560	4436	0.75	11
GF24HSB	37277	3560000	300	780	460	660	330	1016	1016	483	481	1372	1321	27	991	560	5227	0.75	11
GF26HSB	49707	4747000	270	840	540	710	355	1092	1168	559	560	1524	1486	28	1147	650	7993	0.75	11

Misalignment Angle (degrees)	Rating Factor
0.75	1.00
0.50	1.20
0.00	1.60

Catalogue ratings shown are nominal values at 0.75 degrees. For values at misalignments less than 0.75 degrees:- Multiply nominal catalogue values by factor in table left.

### Ordering Code



Long hub versions available. Contact Renold for details. See key stress calculations on Page 14.

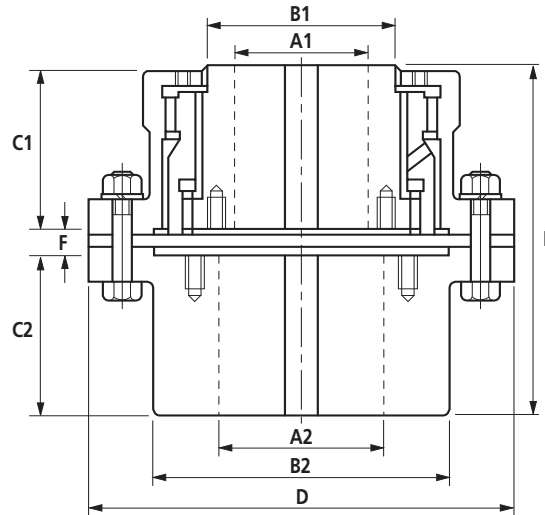
Renold can supply cardan shaft or torque tube assemblies.

Critical speeds must be checked, please contact Renold.

\* Maximum Bore - The maximum bores shown are absolute maximums. Under normal circumstances the boss to bore ratio should not be less than 1.5 for standard applications. Consult Renold for overbore approval.

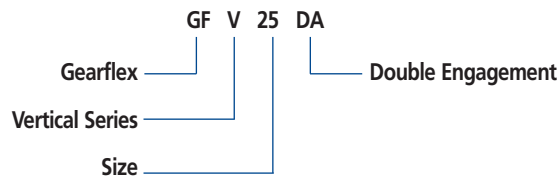
\*\* Speed in excess of these shown may require additional balancing.

## Gearflex GFV



Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max** rpm	Bore A1		Bore A2		Dimensions							Offset		
				Max* mm	Min mm	Max mm	Min mm	B1 mm	B2 mm	C1 mm	C2 mm	D mm	F mm	L mm	Mass kg	WR <sup>2</sup> kg m <sup>2</sup>	Max mm
GFV15DA	14.9	1423	7100	46	14	75	20	60	98	49	47	152	8	104	9	0.019	0.8
GFV20DA	28.2	2693	5400	57	20	95	27	76	124	62	60	178	8	130	17.5	0.044	1.0
GFV25DA	48	4584	4800	78	27	110	27	102	148	77	75	213	9	161	30	0.107	1.2
GFV30DA	77.6	7411	4250	90	27	130	39	117	173	91	89	240	10	190	40	0.200	1.4
GFV35DA	128	12224	4000	110	39	155	39	143	201	106	104	279	12	222	64	0.446	1.7
GFV40DA	196	18718	3600	127	39	180	55	165	233	121	116	318	13	250	94	0.842	2.0
GFV45DA	312	29796	3290	145	55	200	55	191	262	135	130	346	17	282	128	1.350	2.3
GFV50DA	431	41161	2920	165	55	225	55	216	294	153	148	389	17	318	187	2.800	2.6
GFV55DA	578	55199	2630	185	55	250	55	241	324	175	164	425	17	356	245	3.940	3.0
GFV60DA	857	81844	2320	205	55	265	55	267	349	188	182	457	20	390	300	5.130	3.4
GFV70DA	1096	104668	2120	225	55	310	55	292	406	221	221	527	23	465	475	11.040	3.9

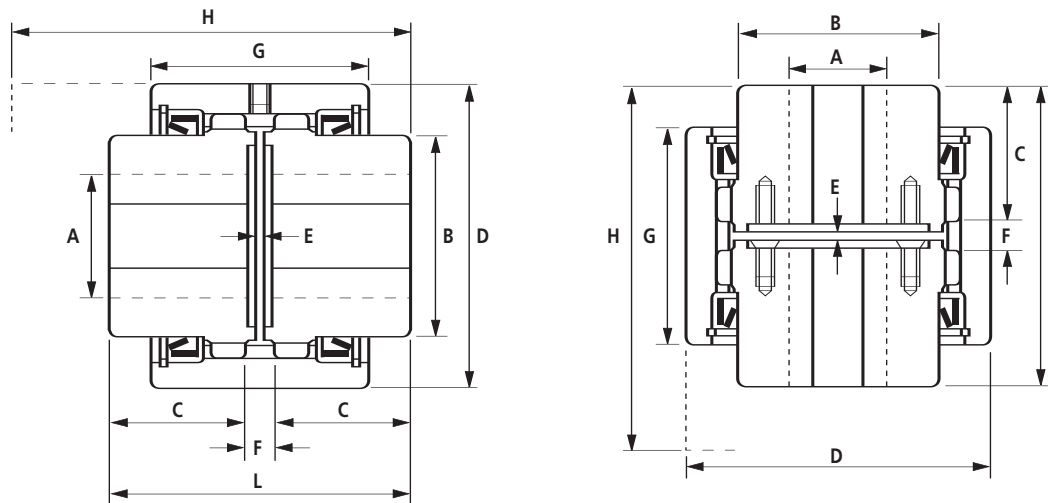
### Ordering Code



\* Maximum Bore - The maximum bores shown are absolute maximums. Under normal circumstances the boss to bore ratio should not be less than 1.5 for standard applications. Consult Renold for overbore approval.

\*\* Speed in excess of these shown may require additional balancing.

## Gearflex NTS

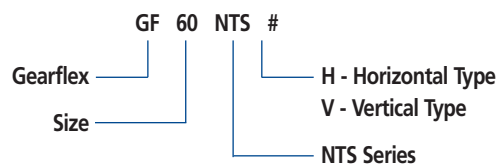


Coupling Size	Power /100rpm Kw	Torque Nominal Nm	Speed Max** rpm	Bore A		Dimensions										Mass kg	Offset Max mm	End Float mm
				Max* mm	Min mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	L mm					
GF10NTS #	7	668	10000	24	10	36	43	67	3	9	70	126	95	1.8	0.18	1.5		
GF11NTS #	10	955	10000	30	12	46	43	79	3	9	70	126	95	2.7	0.18	1.5		
GF12NTS #	16	1528	10000	40	12	58	44	92	3	9	73	130	97	3.6	0.18	1.5		
GF15NTS #	20	1910	10000	40	13	65	49	98	3	9	76	139	107	4.5	0.20	1.5		
GF20NTS #	37	3562	10000	55	18	82	56	121	3	11	92	162	123	7.7	0.20	1.5		
GF25NTS #	64	6112	10000	70	18	107	59	146	6	18	105	186	136	13	0.23	1.5		
GF30NTS #	100	9550	8500	80	30	127	67	171	6	18	114	204	152	20	0.33	3		
GF35NTS #	163	15570	7250	100	38	154	70	200	6	18	121	213	158	30	0.36	3		
GF40NTS #	233	22250	6400	115	60	178	86	229	6	18	140	248	190	42	0.38	3		
GF45NTS #	342	32660	5700	125	72	203	89	260	6	18	146	258	196	58	0.41	3		
GF50NTS #	428	40870	5200	145	85	225	99	283	6	18	152	273	216	74	0.43	3		
GF60NTS #	867	82800	4500	165	85	263	114	324	6	18	184	321	246	120	0.46	3		
GF65NTS #	1090	104223	4200	180	85	285	114	349	6	18	184	321	246	130	0.48	3		
GF70NTS #	1255	120000	3900	190	85	304	124	375	6	18	191	337	266	175	0.48	3		

Misalignment Angle (degrees)	Rating Factor
1.50	1.00
1.00	1.15
0.75	1.30
0.50	1.55
0.00	2.00

Catalogue ratings shown are nominal values at 1.50 degrees.  
For values at misalignments less than 1.50 degrees:-  
Multiply nominal catalogue values by factor in table left.

### Ordering Code



\* Maximum Bore - The maximum bores shown are absolute maximums. Under normal circumstances the boss to bore ratio should not be less than 1.5 for standard applications. Consult Renold for overbore approval.

\*\* Speed in excess of these shown may require additional balancing.

# ***RENOLD***

## ***Hydrastart***



Soft Start - Fluid Couplings



## Hydrastart - Fluid Coupling



**A fluid coupling suitable for soft starting high inertia machinery with reduced current demand, controlled acceleration and torque with motor overload protection.**

### **Coupling Capacity:**

- Maximum power @ 1500RPM 600kW
- Maximum speed 3500RPM

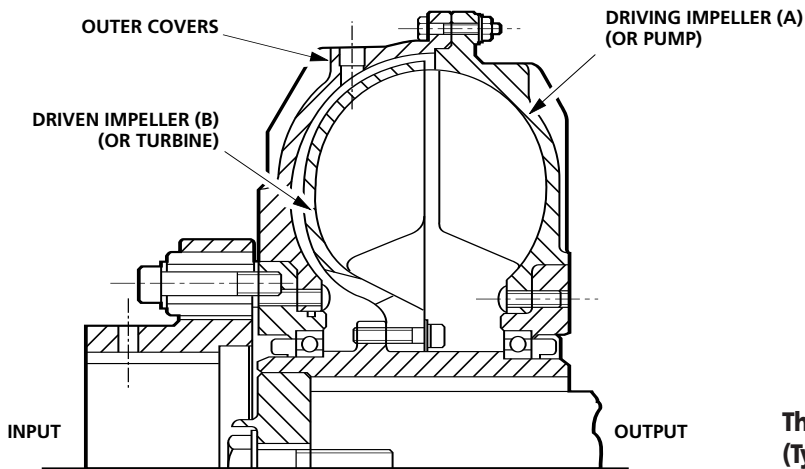
### **Features & Benefits:**

- High inertia controlled torque to 700 kW.
- Soft start - motor starts on low load.
- Allows use of standard squirrel cage motors.
- Overload protection - fusible plug safeguards equipment.
- Dampens torsional vibration, reducing mechanical stress - extends machine life.
- Delay fill version - extends acceleration time and reduces start-up torque.
- Can match load and speed on multi drives.
- Energy saving through reduced current demand at start-up.
- Coupling and V pulley types - design flexibility.

## ***Hydrastart - The Soft Start Solution***



## Operating Principles



The Renold HydraStart constant fill coupling (Type HS) comprises three major components:

The coupling is partially filled with hydraulic oil to a level suitable for the absorbed power of the application and the acceleration characteristics of the driven machinery. The optimum oil fill is that which just allows the driven machine to accelerate from rest, thus providing the best drive overload protection.

Power is supplied to the input side of the coupling by either an electric motor or diesel engine. This causes the driving impeller (A) to be rotated at motor speed, oil is thrown outwards by centrifugal force. The flow of oil is directed across the blades of the impeller towards the opposing turbine (B). Kinetic energy is absorbed by the turbine and translated into torque, which is always equal to the input torque and produces rotation of the output member (in the same direction as the driver).

The low resistance of the impeller at start up allows the motor to quickly accelerate to full speed. The driven load accelerates smoothly to within a small percentage of the motor speed.

This speed difference is referred to as slip and must always be present for the successful operation of a fluid coupling.

Typical values of slip will vary between 2% (large power) and 6% (small power).

All hydraulic Couplings can be driven in either directions of rotation.

The input and output positions shown are standard, but the input can be from either side of the coupling.

The standard drive arrangement allows the outer cover to be rotated whilst at rest to facilitate oil filling.

However, if a brake drum or disc brake is fitted, the brake should be at the coupling output. See page 59.

### TO CALCULATE SLIP %

$$\frac{(\text{INPUT SPEED} - \text{OUTPUT SPEED}) \times 100}{\text{INPUT SPEED}}$$

## Delayed Fill

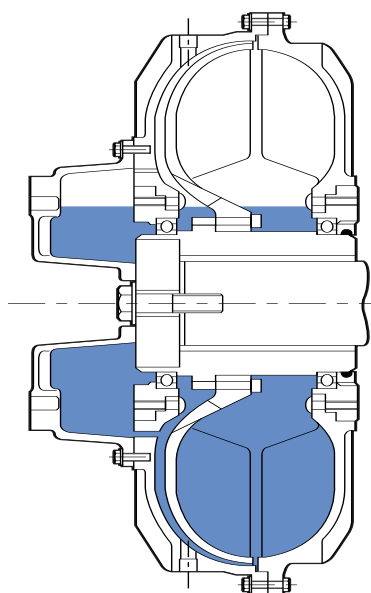
### Hydrastart Delayed Fill Chamber (Type HS...R)

HydraStart (constant fill) hydraulic couplings having a maximum oil fill will limit the starting torque to approximately 200% of nominal torque. It is possible to reduce this figure by reducing the quantity of oil in the circuit.

The disadvantage of this method is that it produces increased slip

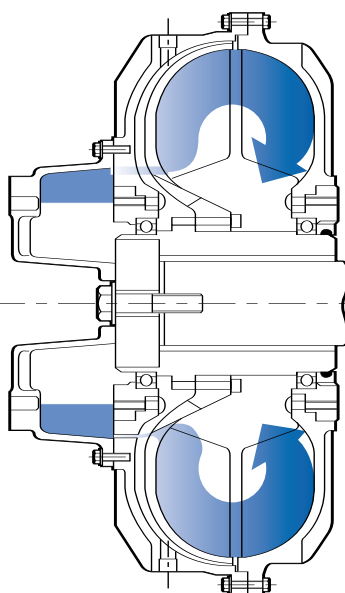
and higher operating temperatures. To overcome these problems a delay fill chamber is available on sizes HS8 and above.

This chamber is a modular option and allows a calibrated oil feed into the working circuit. In this way, starting torque can be reduced whilst minimising slip under normal running.



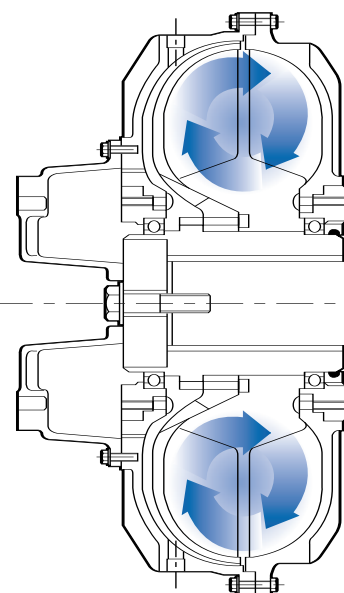
**At rest**

With the drive at rest, oil drains from the working circuit into the delay chamber.



**Accelerating**

At start up the coupling will transmit limited torque, allowing the motor to reach rated speed quickly. Oil flows from the chamber to the working circuit proportionally to the speed.



**Running**

When the coupling achieves its rated speed, almost all of the oil is in the working circuit and the torque is transmitted at the minimum slip value.

For details of extended delay fill options, please contact **RENOLD**



**CAUTION**

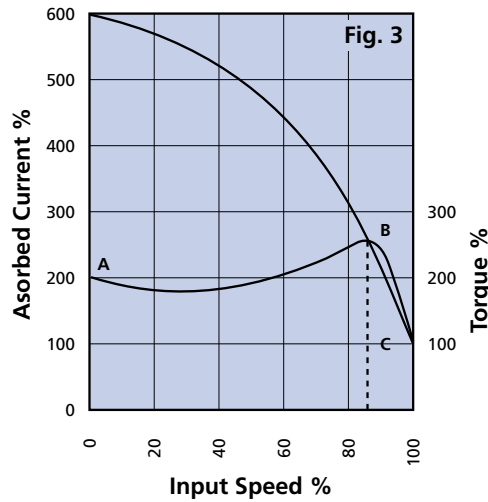
The outer case of the Hydrastart coupling can become hot during operation. Do not touch the coupling or a burn may result.



**CAUTION**

Do not attempt to change the coupling oil during or soon after operation has ceased, as the oil may be hot and could cause burns.

## 'Soft' Starting



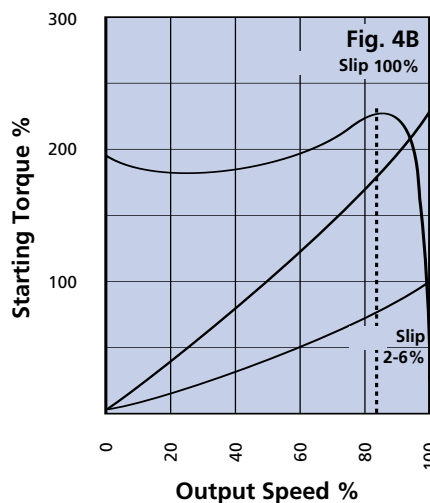
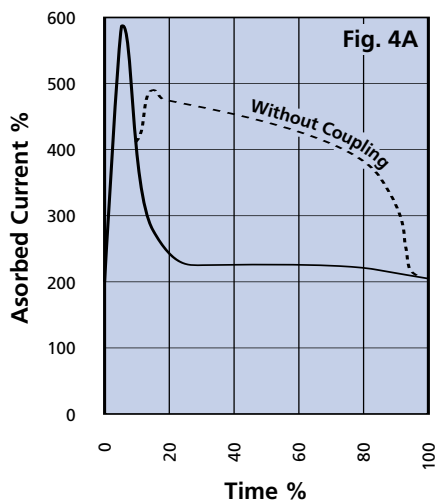
### Effect of starting on electric motors

If a machine is driven by a squirrel cage motor without the use of a HydraStart fluid coupling, the following conditions arise (see Fig. 3).

1. Motor will pull out 250/280% FLT.
2. Motor will consume 6 times FL amps.
3. Increase in motor temperature.

Star-delta starting reduces overheating. However, the starting torque in star is only 30% that in delta and it is often necessary to use larger or more complicated wound motors, particularly with high inertia machinery.

- A = Locked rotor torque
- B = Stall torque 250/280%
- C = Normal torque 100%
- I = Amperage



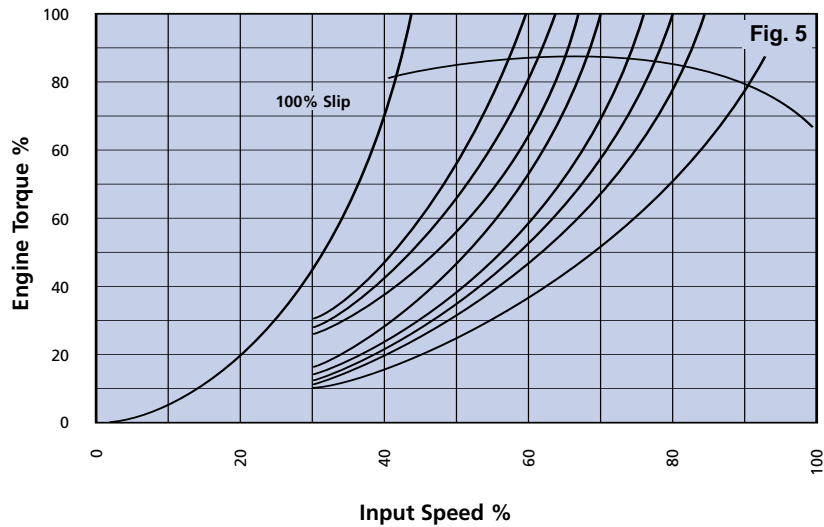
### Effect of starting of electric motors when fitted with HydraStart Couplings

When a drive includes a HydraStart coupling the motor starts on low load, with only an instantaneous current peak at switch on (Fig. 4A). At start up all the motor torque is available to accelerate the motor rotor and coupling impeller (pump).

The driven impeller (turbine) increases speed smoothly from zero rpm until the 100% slip curve intersects the motor torque

curve at approximately 85% motor speed (Fig. 4B). When the torque developed by the HydraStart coupling matches the resisting torque of the driven machine, acceleration of the load commences and continues up to running speed which will be between 94% and 98% of the driving speed depending on the coupling size.

## 'Soft' Starting



### HydraStart couplings fitted on diesel engines

HydraStart fluid couplings can be used with all types of industrial machinery driven by internal combustion engines.

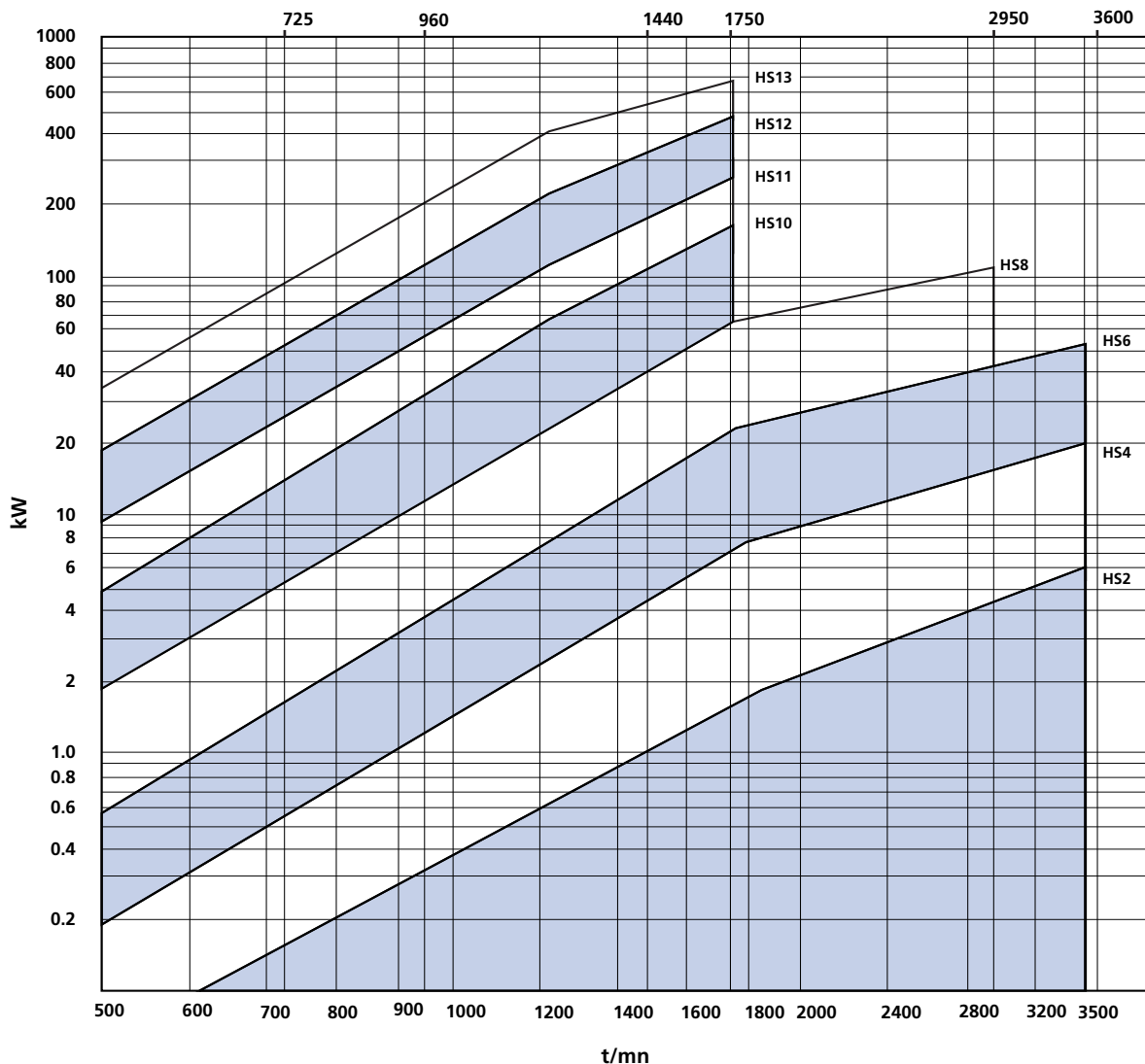
Fig. 5 shows typical engine and coupling performance curves.

The horizontal curve represents the engine's torque curve whilst the vertical shows the torque capacity of the coupling for different slip values and speeds. As load on the driven shaft increases it demands torque, causing the coupling to slip at higher level.

If still greater loads are demanded then the coupling will eventually slip at 100%. Note this does not happen until the engine has developed peak torque.

Thus by using a fluid coupling, it permits an engine to develop maximum torque without stalling under load and promotes rapid acceleration to normal load speed.

## Hydrastart Selection Chart




Larger coupling sizes are available up to 2000kW at 1400 R.P.M.

This chart may be used for the selection of coupling size. If your selection falls on a dividing line, always select the next largest size and use reduced oil fill.


Hydrastart couplings can be used for up to five equi-spaced starts per hour.

Applications requiring more than five starts an hour should always be referred to Renold.

NOTE: Hydraulic couplings will not compensate for an under-sized electric motor.



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



**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.

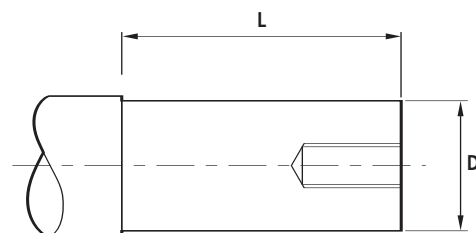
## Coupling Rating Tables

### Selection Table for Standard Motors

Motor			750 rpm			1000 rpm			1500rpm			3000 rpm		
Frame	Shaft Details		Power		Hydrastart	Power		Hydrastart	Power		Hydrastart	Power		Hydrastart
Size	D (mm)	L (mm)	kW	HP	Size	kW	HP	Size	kW	HP	Size	kW	HP	Size
80	19	40				0.25	0.33	HS2						
80	19	40				0.37	0.5		0.55	0.75	HS2	0.75	1	
80	19	40				0.55	0.75		0.75	1		1.1	1.5	
90S	24	50				0.75	1	HS4	1.1	1.5		1.5	2	
90L	24	50				1.1	1.5		1.5	2		2.2	3	
100L	28	60	0.75	1	HS6	1.5	2	HS6	2.2	3	HS4	3	4	HS2
100L	28	60	1.1	1.5		2.2	3		3	4				
112M	28	60	1.5	2		3	4		4	5.5		4	5.5	
132S	38	80	2.2	3	HS8	4	5.5	HS8	5.5	7.5	HS6	5.5	7.5	HS4
132S	38	80	3	4		5.5	7.5		7.5	10		7.5	10	
132M	38	80	4	5.5		7.5	10		11	15		15	20	
132M	38	80	5.5	7.5		11	15		15	20		15	20	
160M	42	110	7.5	10	HS10	15	20	HS10	18.5	25	HS8	18.5	25	HS6
160M	42	110	11	15		15	20		18.5	25		22	30	
160L	42	110	15	20		18.5	25		30	40		30	40	
180M	48	110	18.5	25	HS11	22	30	HS11	37	50	HS10	37	50	HS8
180L	48	110	22	30		22	30		30	40		45	60	
200L	65	110	30	40	HS12	30	40	HS11	55	75	HS10	55	75	HS8
200L	55	110	37	50		37	50		45	60		75	100	
225S	60	140	45	60		45	60		75	100		90	125	
225M	65	110	55	75	HS13	55	75	HS12	90	125	HS11	90	125	HS8
225M	60	140	75	100		75	100		90	125		110	150	
250S	60	140	90	125		90	125		110	150		150	200	
250M	60	140				110	150		132	175		185	250	
250M	70	140				132	175		150	200		200	270	
280S	65	140				150	200		185	250		225	300	
280S	80	170				185	250		200	270		250	335	
280M	65	140				200	270		280	375		315	420	
280M	80	170							315	420		355	475	
315S	85	170							355	475		375	503	
315M	85	170							400	536		400	536	
315L	85	170												
315L	85	170												
315L	85	170												
355S	100	210												
355S	100	210												
355M	100	210												
355L	100	210												
355L	100	210												
355L	100	210												

### Maximum Rating Table

Coupling	Motor Speed / KW				
	750	1000	1200	1500	1800
HS2	0.13	0.37	0.56	1.1	1.7
HS4	0.56	1.34	2.4	4.5	7.4
HS6	1.7	4.0	7.5	15	24
HS8	5.5	13	23	45	65
HS10	15	37	65	110	155
HS11	27	63	116	200	273
HS12	54	125	234	400	502
HS13	97	200	350	587	694



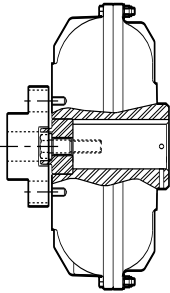
Motor Shaft Detail

For selection requiring larger powers contact Renold.

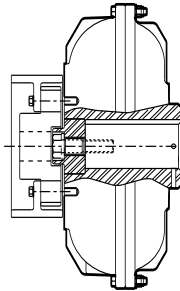
## Standard Available Options

### Non Delay Fill

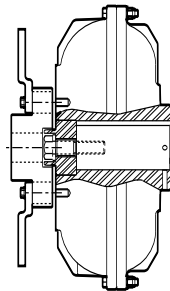
TYPE:  
HS..PF



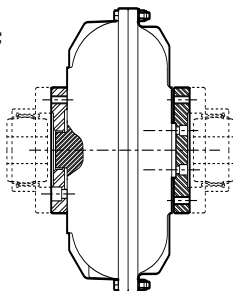
TYPE:  
HS..B



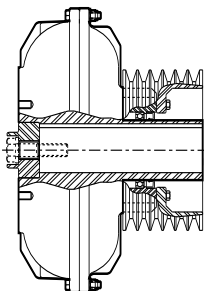
TYPE:  
HS..K



TYPE:  
HS..GF



TYPE:  
HS..VP



### Description

#### Basic coupling

Sleeve bored to suit motor shaft and incorporating Pinflex output coupling. Capable of accepting some misalignment. Flexible buffers can be replaced in situ.

#### Brake Drum options

Basic Pinflex coupling with the addition of a brake drum, metric or inch sizes.

#### Brake Disc options

Basic Pinflex coupling with the addition of a brake disc, metric or inch sizes.

#### Basic coupling incorporating two Flexible Gear half couplings

Capable of accepting some misalignment and allowing removal of HydraStart coupling without displacing either motor or driven shaft. Brake drum or disc options available.

#### Vee Pulley Mounting

Sleeve bored to suit motor shaft. Pulley is attached using external bolts and may easily be replaced.

### Page

58

59

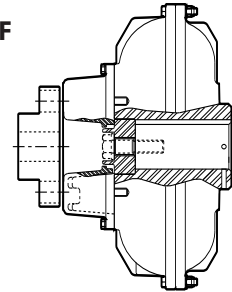
59

60

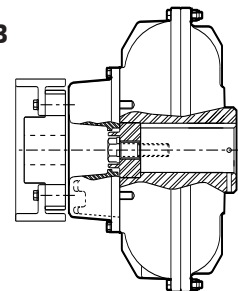
61

### Delay Fill

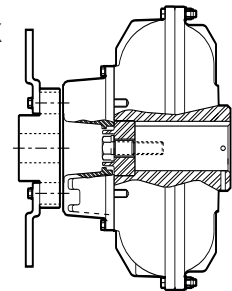
TYPE:  
HS..RPF



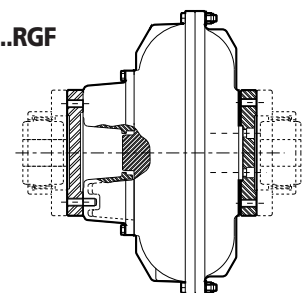
TYPE:  
HS..RB



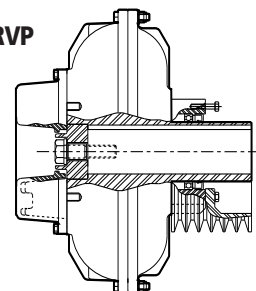
TYPE:  
HS..RK



TYPE:  
HS..RGF



TYPE:  
HS..RVP



Type HSPF, HSB, HSK and HSVP may be used for vertical applications. Please contact Renold for details.



## Overload Protection

When a hydraulic coupling experiences overload there is a correspondingly high slip value accompanied by a rise in the oil temperature. To prevent damage to the drive there are three options available.

### 1. Fusible plug

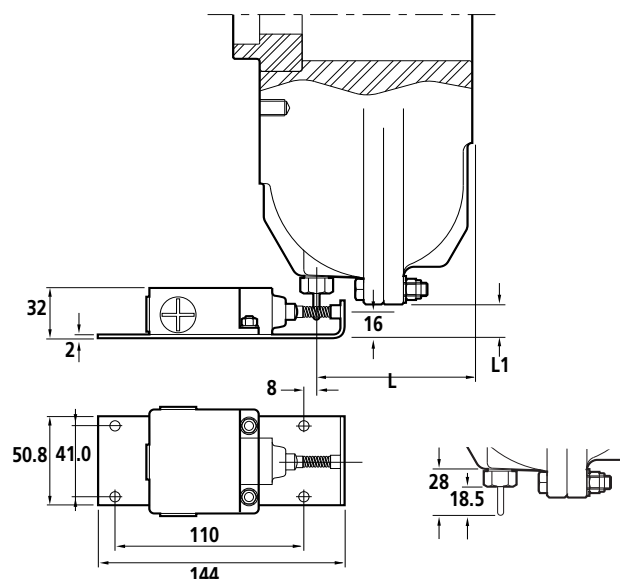
This is fitted as standard on all HydraStart couplings sizes 4 and above. The standard plug is set to fuse at 138°C. Another option available allows fusing at 183°C. Because oil is discharged when the plug fuses it is advisable to correctly guard couplings using this type of device.

### 2. Thermal trigger

Fitted as an option on HydraStart couplings sizes 6 and above, this device prevents oil being discharged from the coupling at overload. As with the fusible plug, two melt temperatures are offered. When melt point is reached a pin is released which engages with a limit switch. The signal from this switch can operate an alarm or switch off the electric motor to protect the drive. After the cause of the overload has been removed the drive can be restarted after replacing the thermal trigger.

### 3. Non-contact sensor

Non-contact speed and heat sensors can be supplied which shut down the drive in the event of overload. Please contact Renold for more information.



### HydraStart Thermal Trigger

Size	A	L	Li
HS6	345	93.7	21.5
HS8	422	123.2	20.0
HS10	511	146.1	16.0
HS11	580	144.5	10.5
HS12	669	173.3	10.5

### Operating principles

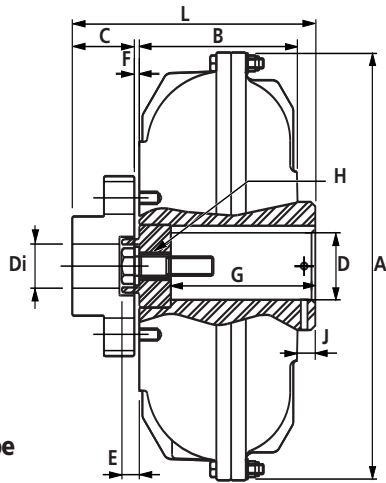
This device will trigger the limit switch if the oil temperature reaches a predetermined level without loss of oil from the coupling. Fusible trigger plug 117°C alternatively 138°C.

### Electrical characteristics

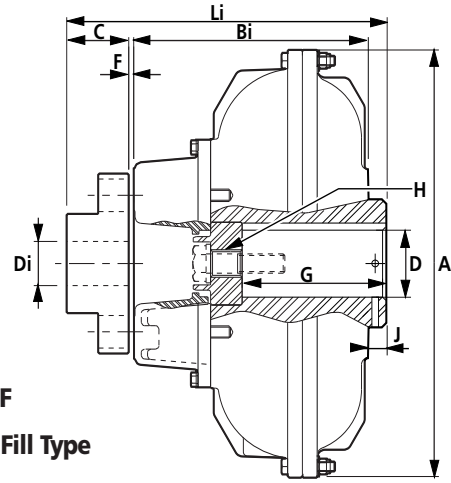
2-Pole 1N/C + 1N/O, conforms to IEC 529 IP 66, contact type XCK rating 500V AC-15

3-20mm ISO Cable Entries.

## Hydrastart Pinflex Coupling - Dimensions (mm)



**HS..PF**  
**Standard Type**  
**Size 2-13**



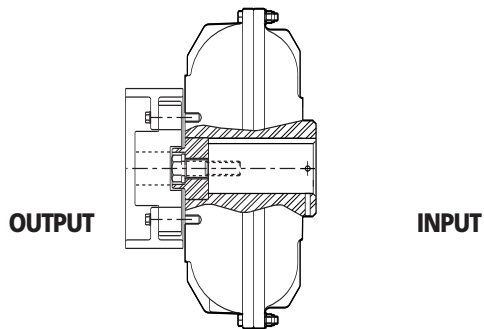
**HS..RPF**  
**Delay Fill Type**  
**Size 8-13**

HydraStart Pinflex Coupling (HS..PF & HS..RPF) Delay fill option available on size 8 and larger

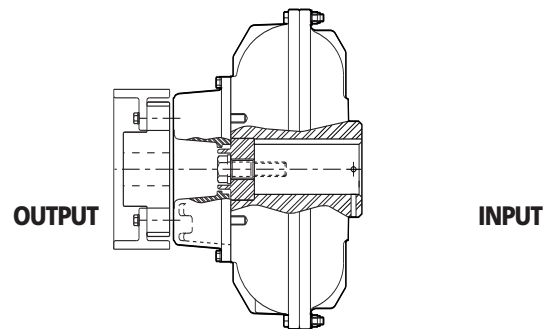
Size	A	B	Bi	C	D Max	Di Max	E	F	G*	H	J	L	Li	Pinflex Cplg. Size	Weight kgs	WR <sup>2</sup> kgm <sup>2</sup>
HS2	229	90	-	44	29	50	13	4	80	0.625" 11 UNC	8	146	-	1	6.7	0.02
HS4	286	107	-	44	42	50	13	4	95	0.625" 11 UNC	7	162	-	1	10.9	0.06
HS6	345	130	-	50	52	55	16	5	114	0.75" 10 UNC	10	195	-	2	20.8	0.16
HS8	422	161	238	75	75	80	20	6	137	1.00" 8 UNC	19	261	338	4	41.2 43.9	0.46 0.49
HS10	511	191	268	89	85	110	20	6	178	1.00" 8 UNC	25	311	388	5	65.2 69.7	1.05 1.11
HS11	580	205	296	110	102	130	20	7	195	1.00" 8 UNC	25	347	438	6	107.4 113.6	2.17 2.26
HS12	669	231	339	110	115	130	23	7	211	1.25" 7 UNC	25	374	482	6	131.7 138.9	3.67 3.78
HS13	751	292	402	130	127	150	23	7	267	1.25" 7 UNC	25	454	564	7	199 207	6.80 7.07

Figures in bold type relate to delay fill coupling only (sizes 8 and above).

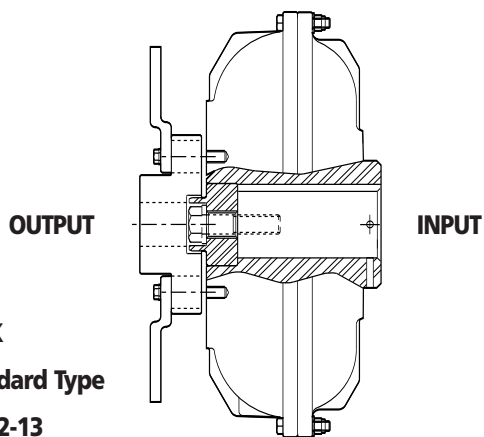
\* It may be necessary to use a spacer (not supplied by Renold) if shaft length is less than dimension 'G'.

**Hydrastart Pinflex Coupling & Brake Drum**

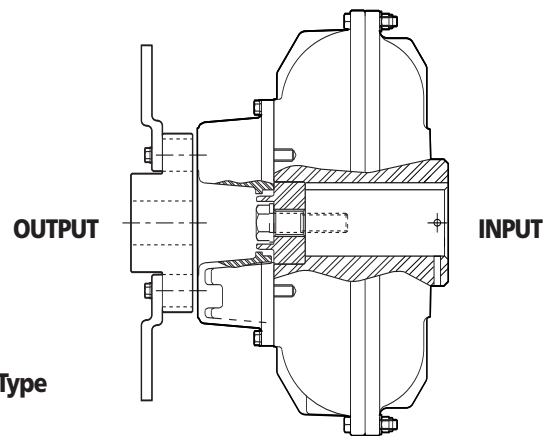
**HS..B**  
Standard Type  
Size 2-13



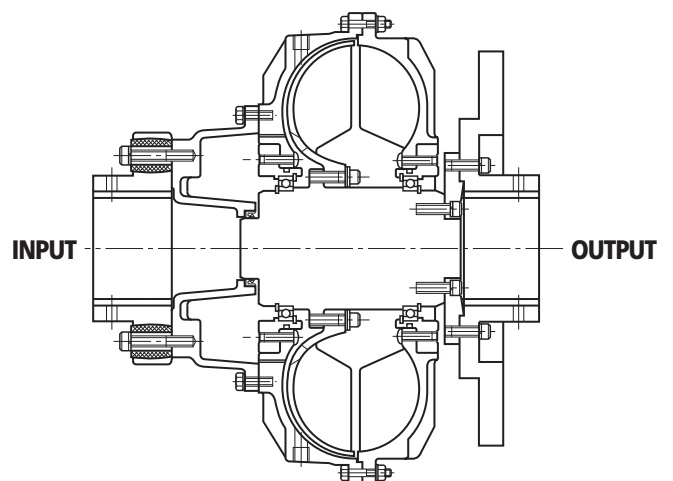
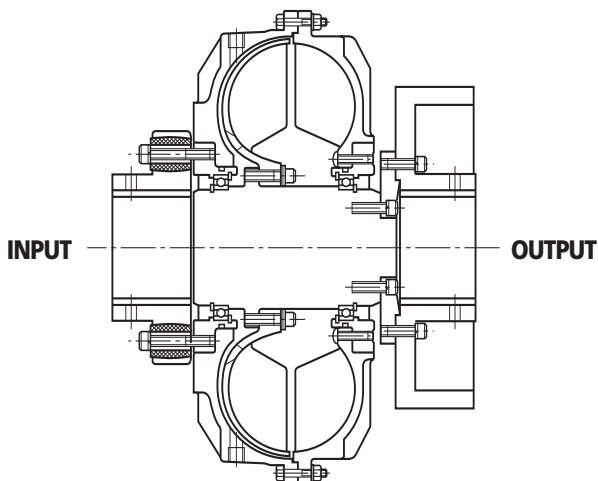
**HS..RB**  
Delay Fill Type  
Size 8-13

**Hydrastart Pinflex Coupling and Disc Brake**

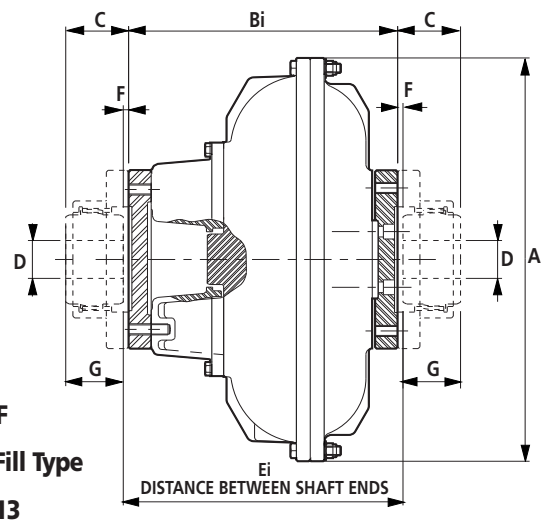
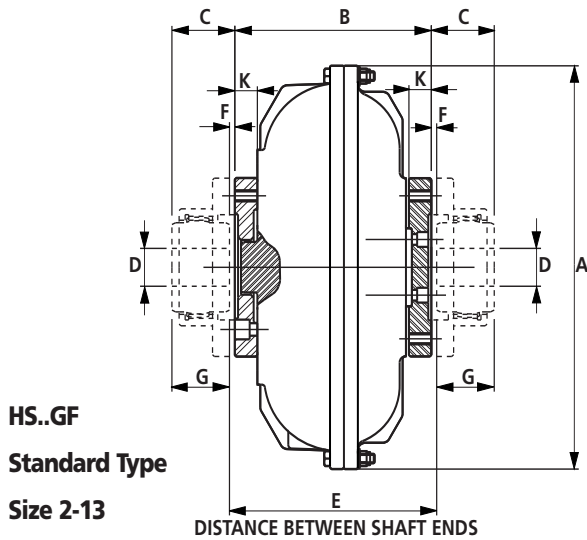
**HS..K**  
Standard Type  
Size 2-13



**HS..RK**  
Delay Fill Type  
Size 8-13

**Hydrastart Pinflex/Rigid & Brake Drum/Disc**

## Hydrastart Gearflex Coupling - Dimensions (mm)



HydraStart Gearflex Coupling (HS..GF & HS..RGF) Delay fill option available on size 8 and larger

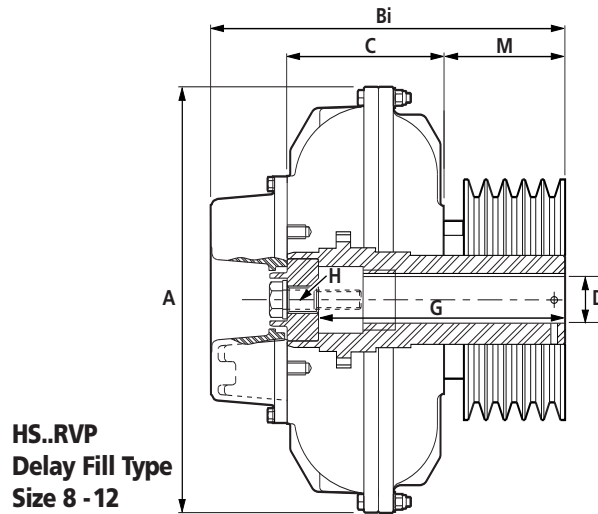
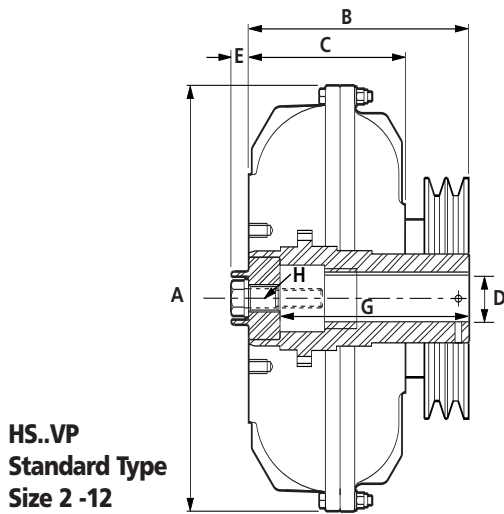
Gearflex Couplings are AGMA standard exposed bolt type

Size	A	B	Bi	C	D Max	E	Ei	F	G	K	Gearflex Cplg. Size	Weight kgs	WR <sup>2</sup> kgm <sup>2</sup>
HS2	229	128		45	44	132		2	43	19	1	7.80	0.03
HS4	286	145		45	44	148		2	43	19	1	12.10	0.06
HS6	345	168		51	58	171		2	49	19	1.5	19.60	0.15
HS8	422	223	<b>300</b>	64	76	226	306	2	62	29	2	<b>47.00</b>	<b>0.51</b>
HS10	511	252	<b>329</b>	94	110	257	335	3	91	29	3	<b>73.50</b>	<b>1.18</b>
HS11	580	267	<b>358</b>	94	110	272	363	3	91	29	3	<b>106.80</b>	<b>2.22</b>
HS12	669	297	<b>405</b>	110	120	303	408	3	106	31	3.5	<b>137.50</b>	<b>3.81</b>
HS13	Details on request												

Figures in bold type relate to delay fill option only (sizes 8 and over).

WR<sup>2</sup> value does not include gear coupling halves.

## Hydrastart Pulley - Dimensions (mm)



Hydrastart Pulley (HS..VP & HS..RVP) Delay Fill Option Available on Size 8 And Larger.

Size	A	B	Bi	C	D Max	E	G*	H	M	Weight kgs.	WR <sup>2</sup> # kg.m <sup>2</sup>	Hydrastart Size	Groove Profile	Max No Grooves	PCD Min
HS2	229	141		90	27	13	123	0.625"	51	4.40	0.02	HS2VP	SPZ	3	106
								11 UNC				SPA	2	110	
												SPB	1	116	
HS4	286	173		107	38	13	154	0.625"	66	9.30	0.05	HS4VP	SPZ	5	140
								11 UNC				SPA	4	144	
												SPB	3	150	
HS6	345	220		130	49	16	195	0.75"	90	15.89	0.13	HS6VP	SPZ	6	162
								10 UNC				SPA	5	166	
												SPB	4	172	
												SPC	3	182	
HS8	422	310	387	161	75	20	267	1.00"	149	41.40	0.45	HS8VP	SPZ	11	188
								8 UNC		44.10	0.48	SPA	9	192	
												SPB	7	198	
												SPC	5	208	
HS10	511	357	434	191	80	20	319	1.00"	166	66.70	1.06	HS10VP	SPZ	13	245
								8 UNC		71.20	1.12	SPA	10	250	
												SPB	8	255	
												SPC	6	265	
HS11	580	418	509	205	95	20	382	1.00"	213	104.10	2.12	HS11VP	SPZ	17	285
								8 UNC		110.30	2.21	SPA	13	289	
												SPB	10	295	
												SPC	8	305	
HS12	669	448	556	231	110	23	403	1.25"	217	137.20	3.71	HS12VP	SPZ	17	330
								7 UNC		144.40	3.83	SPA	13	334	
												SPB	10	340	
												SPC	8	350	

Figures in bold type refer to delay fill coupling option only (sizes 8 and over).

\*It may be necessary to use a spacer (not supplied by Renold) if the shaft length is less than dimension 'G'.

\*WR<sup>2</sup> value does not include the pulley.

Pulley details shown are limitations. For alternative options contact Renold.

**RB and PM Flexible Couplings**

	<b>Page No</b>
Renold Hi-Tec Couplings Company Profile	62
RB Coupling Features	64
RB Coupling Typical Applications	65
RB Coupling - Shaft to Shaft	66
RB Coupling - Flywheel Mounted	67
RB Coupling - Technical Data	72
RB Coupling - Design Variations	75
PM Coupling - Features	76
PM Coupling - Typical Applications	77
PM Coupling - Shaft to Shaft	78
PM Coupling - Mill Motor	80
PM Coupling - Technical Data	82
PM Coupling - Technical Data Standard Blocks	83
PM Coupling - Technical Data Special Round Blocks	85
PM Coupling - Design Variations	86
Selection	88
Prime Mover Service Factors	88
Driven Equipment Service Factors	89
Selection Examples	90
Calculation Service	90
Transient Analysis	91
Rubber Information	92
Damping Characteristics	93
Renold Hi-Tec Couplings Product Range	94
Renold Worldwide Sales & Service	98 - 99

## RB Flexible Coupling



**General purpose, cost effective range which is manufactured in SG iron for torques up to 41kNm.**

### Features & Benefits

- Intrinsically fail safe ensuring continuous operation of the driveline in the unlikely event of rubber damage.
- Control of resonant torsional vibration achieving low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- Maintenance free with no lubrication or adjustment required resulting in low running costs.
- Severe shock load protection avoiding failure of the driveline under short circuit and other transient conditions.
- Misalignment capability allows axial and radial misalignment between the driving and driven machines.
- Zero backlash eliminating torque amplifications through pre-compression of the rubber elements.

### Construction details

- Spheroidal graphite to BS 2789 Grade 420/12
- Separate rubber elements with a choice of grade and hardness with SM70 shore hardness being the standard.
- Rubber elements which are totally enclosed and loaded in compression.

### Applications

- Generator sets
- Pump sets
- Compressors
- Wind turbines
- Metal manufacture
- Bulk handling
- Pulp and paper industry
- General purpose industrial applications

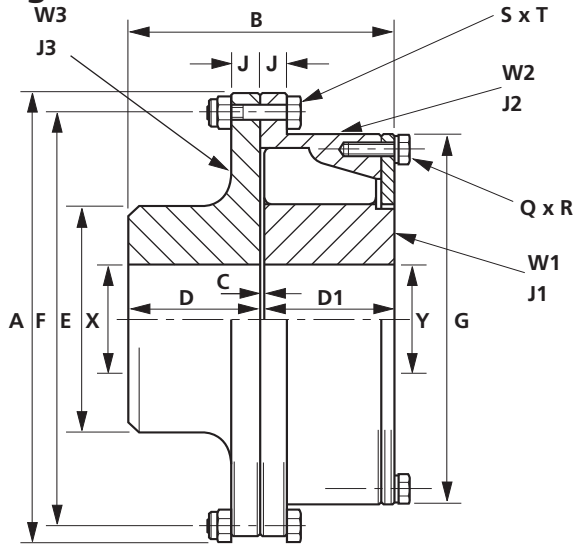
### The Standard range comprises

- Shaft to shaft
- Shaft to shaft with increased shaft engagement
- Flywheel to shaft
- Flywheel to shaft with increased shaft engagement



## RB Shaft to Shaft

Rigid half / Flex half



### Features

- Can accommodate a wide range of shaft diameters
- Easy disconnection of the outer member and driving flange
- Coupling available with limited end float

### Benefits

- Allows the optimum coupling to be selected
- Allows the driving and driven machines to be disconnected
- Provides axial location for armatures with axial float

### Coupling

Size	A mm	B mm	C mm	D mm	D1 mm	E mm	F mm	G mm	J mm	Q mm	R mm	S mm	T mm	U mm	MAX.X mm	MAX.Y mm	MIN.X&Y mm
0.12	200.0	104.8	3.2	50.8	50.8	79.4	177.8	156.5	12.7	5	M8	6	M8	9.2	50	55	30
0.2	222.2	111.2	3.2	54.0	54.0	95.2	200.0	178	14.3	6	M8	6	M8	9.2	60	70	35
0.24	238.1	123.8	3.2	60.3	60.3	101.6	212.7	186.5	15.9	6	M8	6	M10	11.2	65	75	40
0.37	260.3	136.5	3.2	66.7	66.7	120.6	235.0	210	17.5	6	M10	8	M10	11.2	80	85	40
0.73	308.0	174.6	3.2	85.7	85.7	152.4	279.4	251	19.0	6	M10	8	M12	13.2	95	95	55
1.15	358.8	193.7	3.2	95.2	95.2	184.1	323.8	295	19.0	6	M12	10	M12	13.2	115	115	55
2.15	466.7	233.4	4.8	114.3	114.3	222.2	438.15	362	19.0	6	M12	16	M12	13.2	140	140	70
3.86	508.0	260.4	6.4	127.0	127.0	279.4	469.9	435	22.2	7	M12	12	M16	17.25	170	170	80
5.5	577.8	285.8	6.4	139.7	139.7	330.2	536.6	501.5	25.4	8	M12	12	M16	17.25	210	210	90

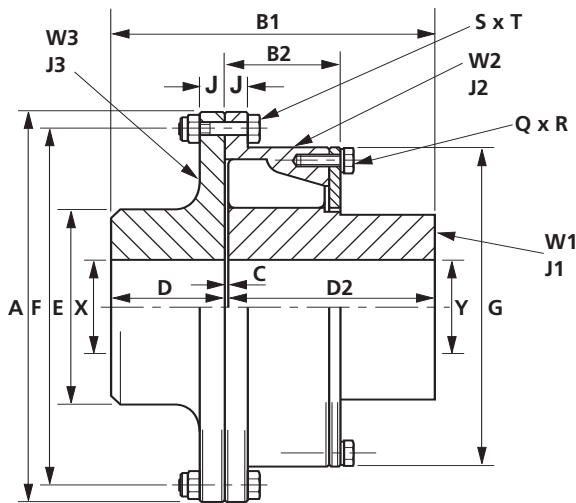
Coupling Size	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg			Inertia (3)Kgm <sup>2</sup>			Allowable Misalignment (2)		
	Per Cavity	Per Coupling	(1)	W1	W2	W3	J1	J2	J3	Radial (mm)	Axial (mm)	Conical (degree)
0.12	1	10	5250	2.82	4.0	4.06	0.0044	0.0232	0.0153	0.75	1.5	0.5
0.2	1	12	4725	4.04	5.05	5.82	0.0084	0.0375	0.027	0.75	1.5	0.5
0.24	1	12	4410	5.29	6.38	7.42	0.0131	0.0546	0.0396	0.75	1.5	0.5
0.37	1	12	4035	7.49	8.14	10.44	0.0233	0.0887	0.0644	0.75	1.5	0.5
0.73	1	12	3410	12.82	13.29	18.03	0.0563	0.20	0.1475	1.0	1.5	0.5
1.15	1	12	2925	23.39	18.41	27.37	0.1399	0.3674	0.2862	1.5	1.5	0.5
2.15	1	12	2250	35.88	33.98	47.43	0.3227	1.1035	0.7998	1.5	2.0	0.5
3.86	1	14	2070	62.81	43.87	75.39	0.8489	1.9161	1.512	1.5	3.0	0.5
5.5	1	16	1820	102.09	59.0	113.32	1.9633	3.4391	2.9796	1.5	3.0	0.5

- (1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.
- (2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.
- (3) Weights and inertias are based on the minimum bore size.



## RB Shaft to Shaft with Increased Shaft Engagement

### Rigid half / Flex half



### Features

- Long Boss Inner member

### Benefits

- Allows small diameter long length shafts to be used
- Reduces key stress
- Allows increased distances between shaft ends
- Full shaft engagement avoids the need for spacer collars

### Coupling

Size	A mm	B1 mm	B2 mm	C mm	D mm	D2 mm	E mm	F mm	G mm	J mm	Q mm	R mm	S mm	T mm	U mm	MAX.X mm	MAX.Y mm	MIN.X&Y mm
0.12	200.0	139.0	54.0	3.2	50.8	85	79.4	177.8	156.5	12.7	5	M8	6	M8	9.2	50	55	30
0.2	222.2	152.2	57.2	3.2	54.0	95	95.2	200.0	178	14.3	6	M8	6	M8	9.2	6	70	35
0.24	238.1	173.5	63.5	3.2	60.3	110	101.6	212.7	186.5	15.9	6	M8	6	M10	11.2	65	75	40
0.37	260.3	189.9	69.8	3.2	66.7	120	120.6	235.0	210	17.5	6	M10	8	M10	11.2	80	85	40
0.73	308.0	233.9	88.9	3.2	85.7	145	152.4	279.4	251	19.0	6	M10	8	M12	13.2	95	95	55
1.15	358.8	268.4	98.4	3.2	95.2	170	184.1	323.8	295	19.0	6	M12	10	M12	13.2	115	115	55
2.15	466.7	309.1	119.0	4.8	114.3	190	222.2	438.15	362	19.0	6	M12	16	M12	13.2	140	140	70
3.86	508.0	343.4	133.4	6.4	127.0	210	279.4	469.9	435	22.2	7	M12	12	M16	17.25	170	170	80
5.5	577.8	386.1	146.0	6.4	139.7	240	330.2	536.6	501.5	25.4	8	M12	12	M16	17.25	210	210	90

Coupling Size	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg			Inertia (3)Kgm <sup>2</sup>			Allowable Misalignment (2)		
	Per Cavity	Per Coupling	(1)	W1	W2	W3	J1	J2	J3	Radial (mm)	Axial (mm)	Conical (degree)
0.12	1	10	5250	4.21	4.0	4.06	0.0059	0.0232	0.0153	0.75	1.5	0.5
0.2	1	12	4725	6.42	5.05	5.82	0.0121	0.0375	0.027	0.75	1.5	0.5
0.24	1	12	4410	8.67	6.38	7.42	0.0193	0.0546	0.0396	0.75	1.5	0.5
0.37	1	12	4035	11.85	8.14	10.44	0.0326	0.0887	0.0644	0.75	1.5	0.5
0.73	1	12	3410	19.43	13.29	18.03	0.0770	0.20	0.1475	1.0	1.5	0.5
1.15	1	12	2925	35.28	18.41	27.37	0.1896	0.3674	0.2862	1.5	1.5	0.5
2.15	1	12	2250	53.81	33.98	47.43	0.4347	1.1035	0.7998	1.5	2.0	0.5
3.86	1	14	2070	95.50	43.87	75.39	1.1833	1.9161	1.512	1.5	3.0	0.5
5.5	1	16	1820	162.79	59.0	113.32	2.8953	3.4391	2.9796	1.5	3.0	0.5

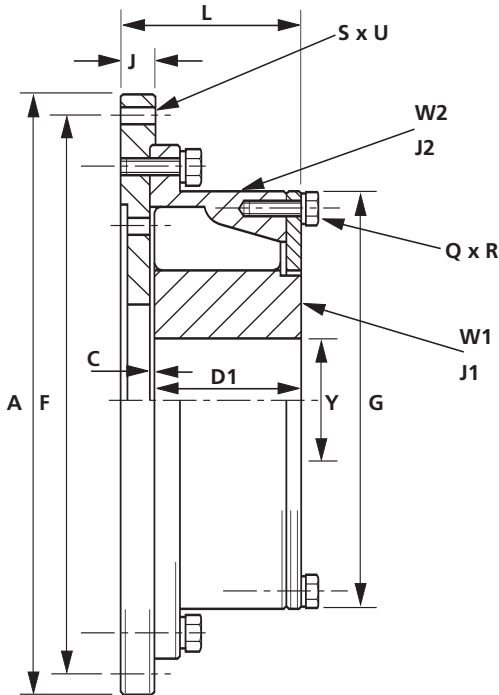
(1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

## RB Standard SAE Flywheel to Shaft

0.24 to 1.15



### Features

- Wide range of adaptor plates
- Choice of rubber compound and hardness
- Short axial length

### Benefits

- Allows the coupling to be adapted to suit most engine flywheels
- Allows control of the torsional vibration system
- Allows the coupling to fit in bell housed applications

### Coupling

Size	SAE No.	A mm	C mm	D1 mm	F mm	G mm	J mm	L mm	Q mm	R mm	S mm	U mm	MAX.Y mm	MIN.Y mm
0.24	10	314.3	3.2	60.3	295.27	186.5	20	79.5	6	M8	8	10.5	75	40
	11.5	352.4	3.2	60.3	333.38	186.5	20	79.5	6	M8	8	10.5	75	40
0.37	11.5	352.4	3.2	66.7	333.38	210	20	85.8	6	M10	8	10.5	85	40
	14	466.7	3.2	66.7	438.15	210	20	85.8	6	M10	8	13.5	85	40
0.73	11.5	352.4	3.2	85.7	333.38	251	20	104.9	6	M10	8	10.5	95	55
	14	466.7	3.2	85.7	438.15	251	20	104.9	6	M10	8	13.5	95	55
1.15	14	466.7	3.2	95.2	438.15	295	20	114.4	6	M12	8	13.5	115	55
	18	571.5	3.2	95.2	542.92	295	28	122.4	6	M12	6	16.7	115	55

### Coupling

Size	SAE No.	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg		Inertia (3)Kgm <sup>2</sup>		Allowable Misalignment (2)		
		Per Cavity	Per Coupling	(1)	W1	W2	J1	J2	Radial (mm)	Axial (mm)	Conical (degree)
0.24	10	1	12	3710	5.29	15.71	0.0131	0.1922	0.75	1.5	0.5
	11.5	1	12	3305	5.29	17.1	0.0131	0.2546	0.75	1.5	0.5
0.37	11.5	1	12	3305	7.49	19.96	0.0233	0.3087	0.75	1.5	0.5
	14	1	12	2500	7.49	28.76	0.0233	0.7487	0.75	1.5	0.5
0.73	11.5	1	12	3310	12.82	24.01	0.0563	0.40	1.0	1.5	0.5
	14	1	12	2500	12.82	35.31	0.0563	0.89	1.0	1.5	0.5
1.15	14	1	12	2500	23.39	39.03	0.1399	1.0274	1.5	1.5	0.5
	18	1	12	2040	23.39	61.0	0.1399	2.3974	1.5	1.5	0.5

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

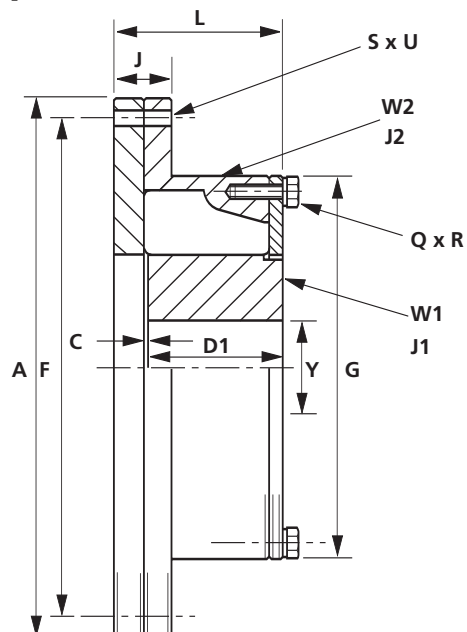
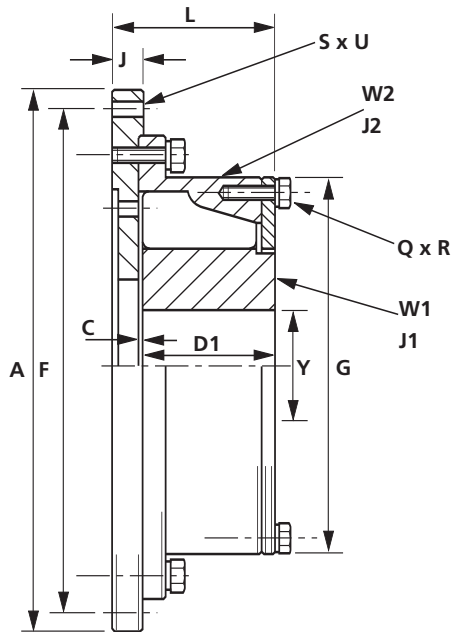
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

## RB Standard SAE Flywheel to Shaft

2.15 - 5.5

Keep Plate (2.15 SAE 14 and 5.5 SAE 18)



**Coupling**

Coupling Size	SAE No.	A mm	C mm	D1 mm	F mm	G mm	J mm	L mm	Q mm	R mm	S mm	U mm	MAX.Y mm	MIN.Y mm
2.15	14	466.7	4.8	114.3	438.15	362.0	35.0	135.05	6	M12	8	13.2	140	70
	18	571.5	4.8	114.3	542.92	362.0	28.0	143.0	6	M12	6	16.7	140	70
	21	673.1	4.8	114.3	641.35	362.0	28.0	143.0	6	M12	12	16.7	140	70
3.86	18	571.5	6.4	127.0	542.92	435.0	28.0	157.35	7	M12	6	16.7	170	80
	21	673.1	6.4	127.0	641.35	435.0	31.0	160.35	7	M12	12	16.7	170	80
	24	733.4	6.4	127.0	692.15	435.0	31.0	160.35	7	M12	12	22	170	80
5.5	18	571.5	6.4	139.7	542.92	501.5	41.4	162.05	8	M12	6	16.7	210	90
	21	673.1	6.4	139.7	641.35	501.5	28.0	170.0	8	M12	12	16.7	210	90
	24	733.4	6.4	139.7	692.15	501.5	31.0	173.05	8	M12	12	22	210	90

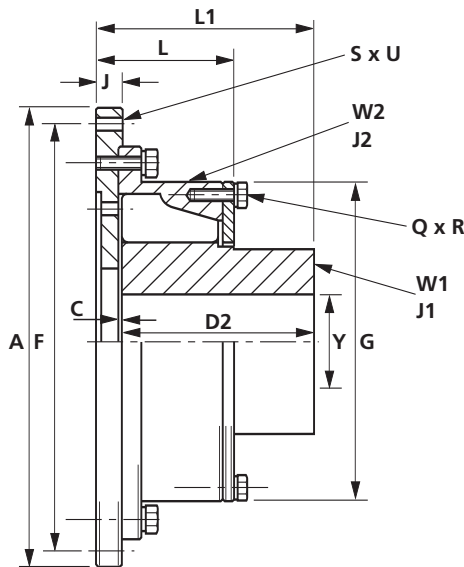
**Coupling**

Coupling Size	SAE No.	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg		Inertia (3)Kgm <sup>2</sup>		Allowable Misalignment (2)		
		Per Cavity	Per Coupling	(1)	W1	W2	J1	J2	Radial (mm)	Axial (mm)	Conical (degree)
2.15	14	1	12	2500	35.88	50.42	0.3227	1.6535	1.5	2.0	0.5
	18	1	12	2040	35.88	79.17	0.3227	3.2935	1.5	2.0	0.5
	21	1	12	1800	35.88	92.19	0.3227	4.9935	1.5	2.0	0.5
3.86	18	1	14	2040	62.81	86.46	0.8489	3.9461	1.5	3.0	0.5
	21	1	14	1800	62.81	110.35	0.8489	6.4661	1.5	3.0	0.5
	24	1	14	1590	62.81	120.33	0.8489	8.1461	1.5	3.0	0.5
5.5	18	1	16	2040	102.09	79.14	1.9633	4.5684	1.5	3.0	0.5
	21	1	16	1800	102.09	117.21	1.9633	7.3291	1.5	3.0	0.5
	24	1	16	1590	102.09	135.46	1.9633	9.6691	1.5	3.0	0.5

- (1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.
- (2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.
- (3) Weights and inertias are based on the minimum bore size.

## RB Standard SAE Flywheel to Shaft with Increased Shaft Engagement

### 0.24 - 1.15



### Features

- Long Boss Inner members

### Benefits

- Allows small diameter long length shafts to be used
- Reduces key stress
- Allows increased distance between shaft end and flywheel
- Full shaft engagement avoids the need for spacer collars

### Coupling

Size	SAE No.	A mm	C mm	D2 mm	F mm	G mm	J mm	L mm	L1 mm	Q mm	R mm	S mm	U mm	MAX.Y mm	MIN.Y mm
0.24	10	314.3	3.2	110	295.27	186.5	20	79.5	129.2	6	M8	8	10.5	75	40
	11.5	352.4	3.2	110	333.38	186.5	20	79.5	129.2	6	M8	8	10.5	75	40
0.37	11.5	352.4	3.2	120	333.38	210	20	85.8	139.1	6	M10	8	10.5	85	40
	14	466.7	3.2	120	438.15	210	20	85.8	139.1	6	M10	8	13.5	85	40
0.73	11.5	352.4	3.2	145	333.38	251	20	104.9	164.2	6	M10	8	10.5	95	55
	14	466.7	3.2	145	438.15	251	20	104.9	164.2	6	M10	8	13.5	95	55
1.15	14	466.7	3.2	170	438.15	295	20	114.4	189.2	6	M12	8	13.5	115	55
	18	571.5	3.2	170	542.92	295	28	122.4	197.2	6	M12	6	16.7	115	55

### Coupling

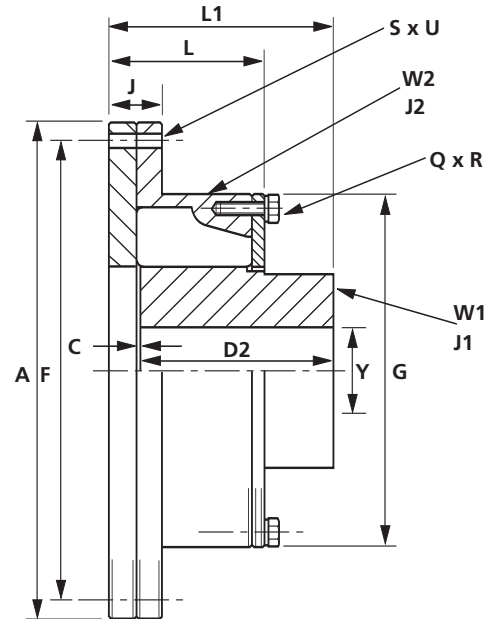
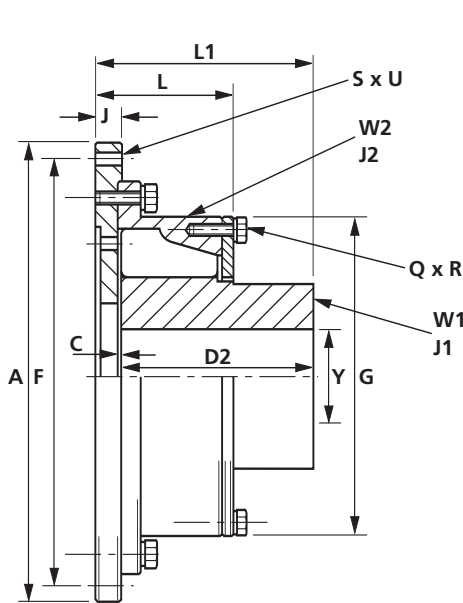
Size	SAE No.	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg		Inertia (3)Kgm <sup>2</sup>		Allowable Misalignment (2)		
		Per Cavity	Per Coupling	(1)	W1	W2	J1	J2	Radial (mm)	Axial (mm)	Conical (degree)
0.24	10	1	12	3710	8.67	15.71	0.0193	0.1922	0.75	1.5	0.5
	11.5	1	12	3305	8.67	17.10	0.0193	0.2546	0.75	1.5	0.5
0.37	11.5	1	12	3305	11.85	19.96	0.0326	0.3087	0.75	1.5	0.5
	14	1	12	2500	11.85	28.76	0.0326	0.7487	0.75	1.5	0.5
0.73	11.5	1	12	3305	19.43	24.01	0.0770	0.40	1.0	1.5	0.5
	14	1	12	2500	19.43	35.31	0.0770	0.89	1.0	1.5	0.5
1.15	14	1	12	2500	35.28	39.03	0.1896	1.0274	1.5	1.5	0.5
	18	1	12	2040	35.28	61.0	0.1896	2.3974	1.5	1.5	0.5

- (1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.
- (2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.
- (3) Weights and inertias are based on the minimum bore size.

## ▶ RB Standard SAE Flywheel to Shaft with Increased Shaft Engagement ◀

**2.15 - 5.5**

**Keep Plate (2.15 SAE 14 and 5.5 SAE 18)**



**Coupling**

Size	SAE No.	A mm	C mm	D2 mm	F mm	G mm	J mm	L mm	L1 mm	Q mm	R mm	S mm	U mm	MAX.Y mm	MIN.Y
2.15	14	466.7	4.8	190	438.15	362.0	35.0	135.0	210.7	6	M12	8	13.5	140	70
	18	571.5	4.8	190	542.92	362.0	28.0	143.0	219.7	6	M12	6	16.7	140	70
	21	673.1	4.8	190	641.35	362.0	28.0	143.0	219.7	6	M12	12	16.7	140	70
3.86	18	571.5	6.4	210	542.92	435.0	28.0	157.4	240.4	7	M12	6	16.7	170	80
	21	673.1	6.4	210	641.35	435.0	31.0	160.4	243.4	7	M12	12	16.7	170	80
	24	733.4	6.4	210	692.15	435.0	31.0	160.4	243.4	7	M12	12	22	170	80
5.5	18	571.5	6.4	240	542.92	501.5	41.4	162.05	262.4	8	M12	6	16.7	210	90
	21	673.1	6.4	240	641.35	501.5	28.0	170.0	271.3	8	M12	12	16.7	210	90
	24	733.4	6.4	240	692.15	501.5	31.0	173.0	273.3	8	M12	12	22	210	90

**Coupling**

Size	SAE No.	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg		Inertia (3)Kgm <sup>2</sup>		Allowable Misalignment (2)		
		Per Cavity	Per Coupling	(1)	W1	W2	J1	J2	Radial (mm)	Axial (mm)	Conical (degree)
2.15	14	1	12	2500	53.81	50.42	0.4347	1.6535	1.5	2.0	0.5
	18	1	12	2040	53.81	79.17	0.4347	3.2935	1.5	2.0	0.5
	21	1	12	1800	53.81	92.19	0.4347	4.9935	1.5	2.0	0.5
3.86	18	1	14	2040	95.50	86.46	1.1833	3.9461	1.5	3.0	0.5
	21	1	14	1800	95.50	110.35	1.1833	6.4661	1.5	3.0	0.5
	24	1	14	1590	95.50	120.33	1.1833	8.1461	1.5	3.0	0.5
5.5	18	1	16	2040	162.79	79.14	2.8953	4.5684	1.5	3.0	0.5
	21	1	16	1800	162.79	117.21	2.8953	7.3291	1.5	3.0	0.5
	24	1	16	1590	162.79	135.46	2.8953	9.6691	1.5	3.0	0.5

- (1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.
- (2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.
- (3) Weights and inertias are based on the minimum bore size.

## RB Technical Data

### 1.1 Diesel Engine Drives

The RB Coupling is selected on the "nominal torque"  $T_{KN}$  without service factors for Diesel Drive applications.

The full torque capacity of the coupling for transient vibration whilst passing through major criticals on run up is published as the maximum torque.

( $TK_{max} = 3 \times T_{KN}$ ).

There is an additional torque capacity built into the coupling for short circuit and shock torques, which is

$3 \times T_{kmax}$

The published "Vibratory torque  $T_{KV}$ ", is a fatigue function according to DIN740 and not significant in diesel engine drives, the vibratory torque values shown in the Technical Data are at the frequency of 10Hz. The measure used for acceptability of the coupling under vibratory torque is heat dissipation of the rubber elements. The maximum allowable heat dissipation shown in the technical data is at a 30°C ambient temperature.

### 1.2 Industrial Drives

For industrial Electrical Motor Applications refer to the "Selection Procedures" and base the selection on  $T_{kmax}$  with the appropriate service factors.

The service factors used in the "Selection Procedures" are based upon 40 years experience of drives and their shock frequency/amplitude.

The stated  $TK_{max}$  quoted should not be exceeded by design, without reference to Renold Hi-Tec Couplings.

Care needs to be taken in the design of couplings with shaft brakes to ensure the coupling torques are not increased by severe deceleration.

### 2.0 Stiffness Properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The RB series is a non-bonded type operating with the Rubber-in-Compression principle.

### 2.1 Axial Stiffness

When subject to misalignment forces in the axial direction, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torques.

Given sufficient axial force as shown in the catalogue, the coupling will slip to its new position immediately.

### 2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the Technical Data.

### 2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque (see Technical Data) and temperature.

### 2.4 Prediction of the system torsional vibration characteristics.

An adequate prediction of the system torsional vibration characteristics can be made by the following method.

**2.4.1** Use the torsional stiffness as published in the catalogue which is based upon data measured at a 30°C ambient temperature ( $C_{T30}$ ).

**2.4.2** Repeat the calculation made as 2.4.1 but using the maximum temperature correction factor  $St_{100}$  and  $M_{100}$  for the rubber selected for both torsional stiffness and dynamic magnifier from the table on page 73.

$$C_{T100} = C_{T30} \times St$$

**2.4.3** Review the calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue, the coupling is then considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range the actual temperature of the coupling will need to be calculated at this speed.

## RB Technical Data

Rubber Grade	Temp <sub>max</sub>	S <sub>t</sub>
SM 60	100	S <sub>t100</sub> = 0.75
SM 70	100	S <sub>t100</sub> = 0.63
SM 80	100	S <sub>t100</sub> = 0.58

**SM 70 is considered "standard"**

Rubber Grade	Dynamic Magnifier at 30°C (M <sub>30</sub> )	Dynamic Magnifier at 100°C (M <sub>100</sub> )
SM 60	8	10.7
SM 70	6	9.5
SM 80	4	6.9

**SM 70 is considered "standard"**

### 2.5 Prediction of the actual coupling temperature and torsional stiffness

- 2.5.1** Use the torsional stiffness as published in the catalogue, which is based upon data measured at 30°C and the dynamic magnifier at 30°C. (M<sub>30</sub>)
- 2.5.2** Compare the synthesis value of the calculated heat load in the coupling (P<sub>k</sub>) at the speed of interest to the "Allowable Heat Dissipation" (P<sub>kW</sub>).

The coupling temperature rise

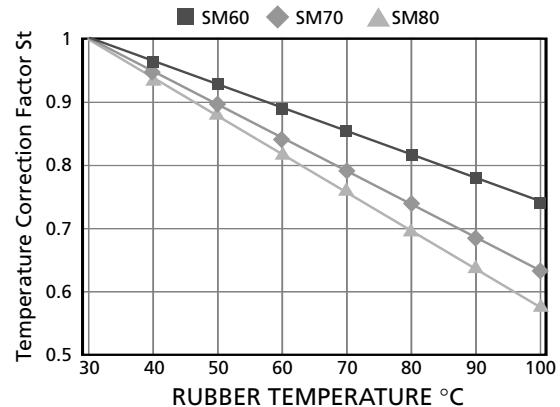
$$^{\circ}\text{C} = \text{Temp}_{\text{coup}} = \left( \frac{P_k}{P_{kW}} \right) \times 70$$

The coupling temperature =  $\vartheta$

$$\vartheta = \text{Temp}_{\text{coup}} + \text{Ambient Temp.}$$

- 2.5.3** Calculate the temperature correction factor S<sub>t</sub> from 2.6 (if the coupling temperature > 100°C, then use S<sub>t100</sub>). Calculate the dynamic Magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier.
- 2.4** Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

### 2.6 Temperature Correction Factor



### 2.7 Dynamic Magnifier Correction Factor

The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \quad \varphi_T = \varphi_{30} \times S_t$$

Rubber Grade	Dynamic Magnifier (M <sub>30</sub> )	Relative Damping $\varphi_{30}$
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57

**SM 70 is considered "standard"**

## RB Technical Data

Coupling Size	Nominal Torque $T_{KN}$ (kNm)	Maximum Torque $T_{kmax}$ (kNm)	Vibratory Torque $T_{kw}$ (kNm)	Allowable Dissipated Heat at Amb. Temp. 30°C $P_{kw}$ (W)		
				SM60	SM70	SM80
0.12	0.314	0.925	0.122	90	98	100
0.2	0.483	1.425	0.188	112	123	138
0.24	0.57	1.72	0.222	125	138	154
0.37	0.879	2.635	0.342	140	155	173
0.73	1.73	5.35	0.672	185	204	228
1.15	2.731	8.1	1.062	204	224	250
2.15	5.115	15.303	1.989	246	270	302
3.86	9.159	27.4	3.561	336	369	410
5.5	13.05	41.0	5.075	426	465	520

Coupling Size	Dynamic Torsional Stiffness (MNm/rad)											
	@ 0.25 $T_{KN}$			@ 0.50 $T_{KN}$			@ 0.75 $T_{KN}$			@ 1.0 $T_{KN}$		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
0.12	0.006	0.007	0.020	0.014	0.016	0.028	0.030	0.029	0.042	0.045	0.043	0.052
0.2	0.010	0.012	0.032	0.030	0.036	0.046	0.050	0.048	0.070	0.080	0.073	0.086
0.24	0.014	0.016	0.042	0.030	0.033	0.060	0.065	0.062	0.089	0.100	0.092	0.110
0.37	0.018	0.022	0.060	0.042	0.048	0.087	0.100	0.091	0.132	0.145	0.138	0.163
0.73	0.035	0.041	0.111	0.080	0.089	0.160	0.170	0.168	0.242	0.270	0.251	0.298
1.15	0.050	0.064	0.173	0.130	0.138	0.249	0.280	0.260	0.374	0.420	0.390	0.462
2.15	0.110	0.118	0.318	0.245	0.254	0.458	0.500	0.480	0.690	0.800	0.719	0.851
3.86	0.200	0.240	0.637	0.500	0.510	0.918	1.000	0.964	1.384	1.550	1.448	1.709
5.5	0.300	0.400	0.920	0.800	0.850	1.500	1.600	1.540	2.560	2.650	2.450	3.550

Coupling Size	Radial Stiffness No Load (N/mm)			Radial Stiffness @ $T_{KN}$ (N/mm)			Axial Stiffness No Load (N/mm)			Max. Axial Force (1) (N) @ $T_{KN}$		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
0.12	1020	1255	1728	2046	2134	2310	1030	1100	2940	1080	1150	1300
0.2	1260	1550	2135	2536	2638	2855	1250	1350	3690	1350	1440	1600
0.24	1435	1765	2430	2880	3000	3250	1400	1510	4060	1500	1600	1760
0.37	1594	1962	2700	3207	3435	3610	1600	1710	4620	1700	1800	2000
0.73	2116	2586	3654	4250	4396	4885	2095	2200	6060	2200	2360	2600
1.15	2310	2845	3915	4650	4835	5235	2310	2500	6700	2460	2600	2900
2.15	2870	3530	4860	5780	6000	6500	2850	3100	8220	3000	3200	3500
3.86	3740	4600	6330	7520	7820	8465	3700	4100	10760	3900	4100	4600
5.5	4728	5810	8008	9510	9890	10700	4700	5200	13580	5000	5300	5800

NB. SM70 is supplied as standard rubber grade with options of rubber grades SM60 or SM80 if these are considered a better solution to a dynamic application problem. It should be noted that for operation above 80% of the declared maximum coupling speed the coupling should be dynamically balanced.

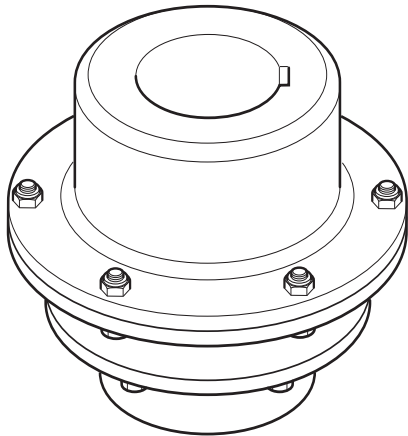
(1) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.



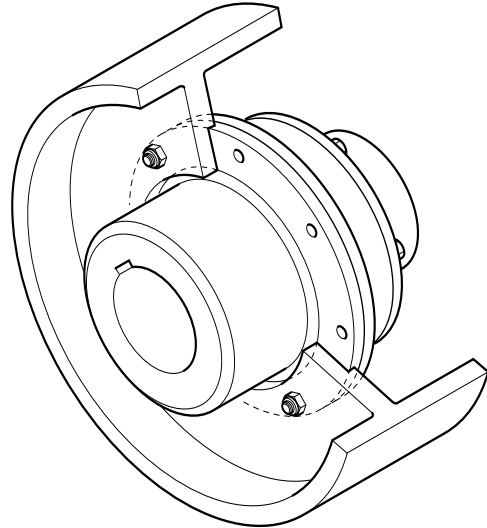
## RB Design Variations

The RB coupling range can be adapted to meet customer needs. Below are some of the arrangements that have been produced.

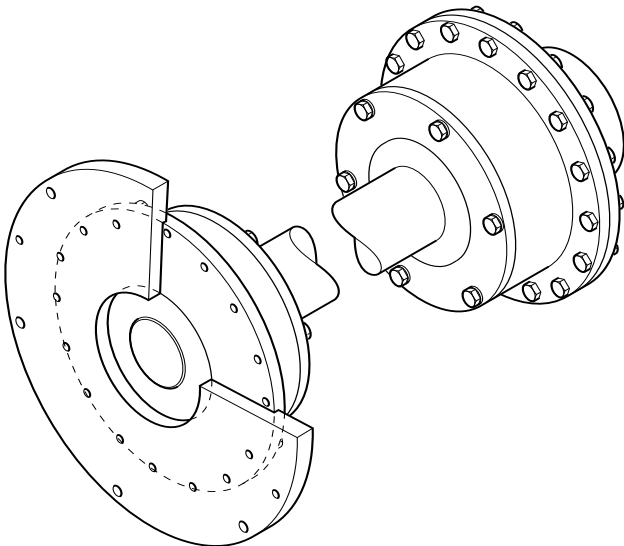
For more comprehensive list contact Renold Hi-Tec Couplings.



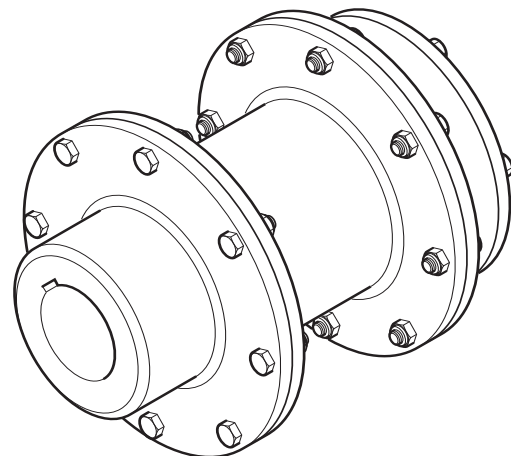
**Coupling with large boss driving flange and long boss inner member for vertical applications.**



**Coupling with brake drum for use on cranes, fans and conveyor drives.**



**Cardan shaft coupling used to increase the misalignment capability and half the torsional stiffness.**



**Spacer coupling used to increase the distance between shaft ends and allow easy access to driven and driving machine.**

## PM Flexible Coupling



### Heavy duty steel coupling for torques up to 6000KNm

#### Features & Benefits

- Severe shock load protection avoiding failure of the driveline under high transient torques.
- Intrinsically fail safe ensuring continuous operation of the driveline in the unlikely event of rubber failure or damage.
- Maintenance free with no lubrication or adjustment required resulting in low running costs.
- Vibration control achieving low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- Zero backlash eliminating torque amplifications through pre-compression of the rubber elements.
- Misalignment capability allows axial and radial misalignment between the driving and driven machines.

#### Construction details

- PM Couplings up to and including PM600 are manufactured in steel. Driving flanges up to and including PM60 are steel forgings to BS970 grade 070 M55. Driving flanges PM90 to PM600 and all inner and outer members up to PM600 are steel casting to BS 3100 grade A4.
- PM Couplings above PM900 are supplied in spheroidal graphite to BS2789 grade 420/12 unless otherwise specified.

#### The Standard range comprises

- Shaft to shaft
- Flange to shaft
- Mill motor coupling
- Brake drum coupling

#### Applications

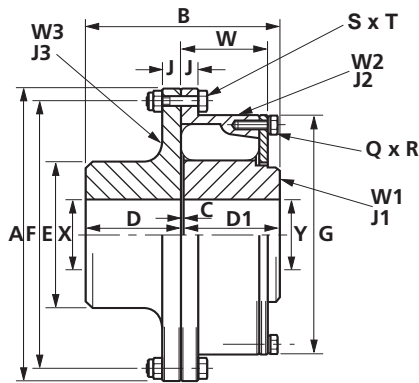
- Metal manufacture
- Mining and mineral processing
- Pumps
- Fans
- Compressors
- Cranes and hoists
- Pulp and paper industry
- General heavy duty industrial applications

- Separate rubber elements with a choice of grade and hardness, styrene butadiene with 60 shore hardness (SM60) being the standard.
- Rubber elements loaded in compression.
- Rubber elements are totally enclosed.

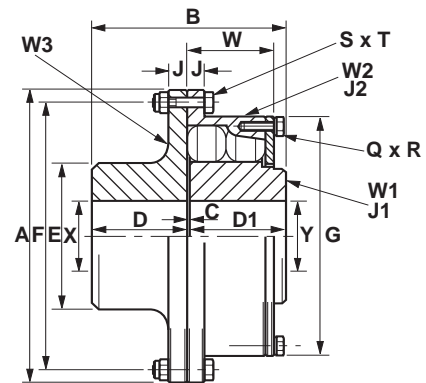


## PM Shaft to Shaft PM 0.4 to PM 130 Data

**0.4 - 60**



**90 - 130**



**Coupling**

Size	A mm	B mm	C mm	D mm	D1 mm	E mm	F mm	G mm	J mm	Q mm	R mm	S mm	T mm	W mm	MAX.X&Y mm	MIN.X mm	MIN.Y mm
0.4	161.9	103	1	51	51	76	146	133	9.5	5	M8	8	M8	36	41	27	27
0.7	187.3	110	2	54	54	92	171.4	157	11	5	M8	8	M8	39	51	27	27
1.3	215.9	130	2	64	64	108	196.8	181	12	6	M8	8	M8	46	64	35	37
3	260.3	143	3	70	70	122	235	221	14.5	6	M8	8	M8	60	73	37	40
6	260	175	3	86	86	135	240	222	11	8	M8	12	M8	81	85	50	50
8	302	193	3	95	95	148	276	245	13.5	8	M10	12	M12	89	95	62	55
12	338	221.5	3.5	109	109	168	312	280	14	8	M12	12	M12	102	109	68	65
18	392	254	4	125	125	195	360	320	16	8	M16	12	M16	118	125	80	70
27	440	290.5	4.5	143	143	220	407	367	18.5	8	M16	12	M16	134	143	90	85
40	490	329	5	162	162	252	458	418	21	8	M16	16	M16	152.7	162	105	105
60	568	377.5	5.5	186	186	288	528	479	24	8	M20	12	M20	175	186	120	110
90	638	432.5	6.5	213	213	330	598	548	26.5	8	M20	16	M20	200	213	140	140
130	728	487	7	240	240	373	680	620	31	8	M24	16	M24	226	240	160	160

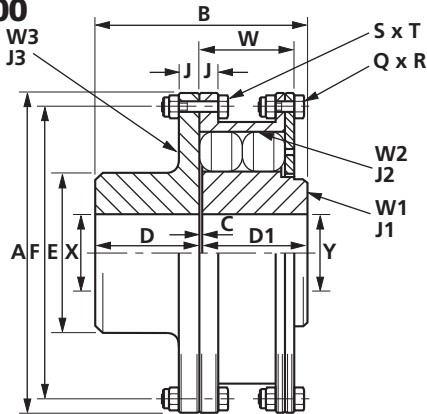
**Coupling**

Size	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg				Inertia (3)Kgm <sup>2</sup>			Allowable Misalignment (2)		
	Per Cavity	Per Coupling	(1)	W1	W2	W3	Total	J1	J2	J3	Radial (mm)	Axial (mm)	Conical (degree)
0.4	1	10	7200	1.9	2.0	2.8	6.7	0.002	0.006	0.005	0.8	0.8	0.5
0.7	1	10	6300	2.8	2.9	4.3	10.0	0.004	0.014	0.013	0.8	1.2	0.5
1.3	1	12	5400	4.5	4.6	6.6	15.7	0.008	0.019	0.025	0.8	1.2	0.5
3	1	12	4500	6.9	6.0	10.0	22.9	0.018	0.049	0.05	1.2	1.2	0.5
6	1	16	4480	8.9	6.55	10.84	26.3	0.026	0.072	0.058	1.5	1.25	0.5
8	1	16	3860	11.62	10.92	15.14	37.7	0.050	0.149	0.116	1.6	1.5	0.5
12	1	16	3450	17.74	15.86	21.24	54.8	0.101	0.273	0.194	1.6	1.75	0.5
18	1	16	2975	27.0	24.59	33.03	84.6	0.203	0.560	0.406	1.6	2.0	0.5
27	1	16	2650	40.18	35.34	47.80	123.3	0.392	1.041	0.748	1.9	2.25	0.5
40	1	16	2380	59.5	50.47	69.32	179.3	0.756	1.898	1.345	2.1	2.5	0.5
60	1	16	2050	89.45	77.80	104.63	271.9	1.491	3.867	2.719	2.4	2.75	0.5
90	2	32	1830	132.0	111.96	151.78	395.7	2.872	7.188	4.955	2.8	3.25	0.5
130	2	32	1600	191.11	165.24	222.39	578.7	5.330	13.680	9.565	3.3	3.5	0.5

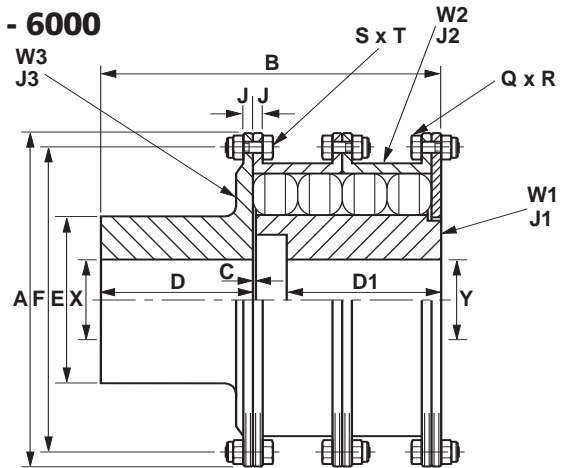
- (1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.
- (2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.
- (3) Weights and inertias are calculated with mean bore for couplings up to and including PM600 and with maximum bore for PM900 and above.
- (4) Oversize shafts can be accommodated in large boss driving flanges, manufactured to customer's requirements.
- (5) PM0.4 - PM3 driving flanges are available with solid bores on request.

**PM Shaft to Shaft PM 180 to PM 6000 Data**

**180 - 600**



**900 - 6000**



**Coupling**

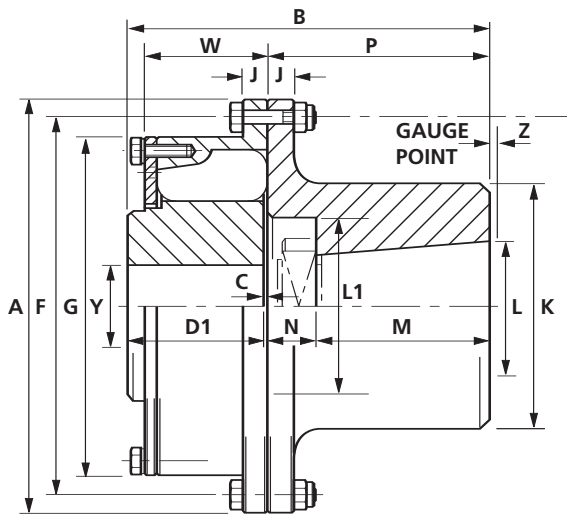
Size	A mm	B mm	C mm	D mm	D1 mm	E mm	F mm	J mm	Q mm	R mm	S mm	T mm	W mm	MAX.X&Y mm	MIN.X mm	MIN.Y mm
180	798	554	8	268	268	415	750	33.5	12	M24	20	M24	252	268	167	170
270	925	623	9	307	307	475	865	36	12	M30	20	M30	288.5	307	192	195
400	1065	710.5	10.5	350	350	542	992	43	12	M36	20	M36	328	350	232	235
600	1195	812	12	400	400	620	1122	52	24	M36	24	M36	376	400	285	285
900	1190	1024	11.5	455	455	706	1140	26.5	32	M24	32	M24	569	455	-	-
1300	1330	1158	12.5	515	515	798	1280	33.5	32	M24	32	M24	643	515	-	-
1800	1490	1291	14	574	574	889	1430	36	32	M30	32	M30	717	574	-	-
2700	1685	1478	16.5	657	657	1018	1625	36	32	M30	32	M30	821	657	-	-
4000	1925	1685	18.5	749	749	1160	1855	43	32	M36	32	M36	936	749	-	-
6000	2210	1928	21.5	857	857	1328	2125	52	32	M42	32	M42	1071	857	-	-

Coupling Size	Rubber Elements		Max. Speed (rpm)	Weight (3)Kg				Inertia (3)Kgm <sup>2</sup>			Allowable Misalignment (2)		
	Per Cavity	Per Coupling	(1)	W1	W2	W3	Total	J1	J2	J3	Radial (mm)	Axial (mm)	Conical (degree)
180	2	32	1460	262.3	266.78	297.4	826.5	9.14	28.80	15.35	3.5	4.0	0.5
270	2	32	1260	389.0	414.0	437.3	1240.3	17.88	59.30	29.89	3.9	4.5	0.5
400	2	32	1090	562.4	633.4	651.2	1847	34.03	119.5	60.66	4.6	5.25	0.5
600	2	32	975	813.3	909.1	946.7	2669.1	65.54	220.2	115.7	5.2	6.0	0.5
900	4	64	975	1509	629	1229	3367	140	165	108	5.0	5.75	0.5
1300	4	64	860	1656	1121	1280	4057	221	392	184	5.4	6.25	0.5
1800	4	64	770	2347	1579	1765	5691	388	688	315	6.1	7	0.5
2700	4	64	680	3515	2250	2582	8347	761	1275	582	7.2	8.25	0.5
4000	4	64	600	5147	3367	3850	12364	1444	2490	1140	8.0	9.25	0.5
6000	4	64	520	7831	5082	5833	18746	2878	4921	2290	9.3	10.75	0.5

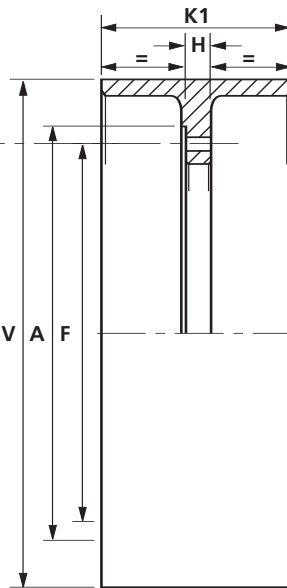
- (1) For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.
- (2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.
- (3) Weights and inertias are calculated with mean bore for couplings up to and including PM600 and with maximum bore for PM900 and above.
- (4) Oversize shafts can be accommodated in large boss driving flanges, manufactured to customer's requirements.

# PM Mill Motor Couplings

**Mill motor coupling**



**Brakedrum**



Brakedrums may be used in conjunction with the whole range of PM couplings and may be bolted on either the driving flange or flexible half side of the coupling, the recess -  $\phi A$  - locating on the outside diameter of the coupling.

Recommended brake drums for each size of coupling are shown in the table, but  $\phi V$  is adjustable to suit "Non-standard" applications.

## Type PM-SDW dimensions table (Ingot Motor)

Coupling Size	Dimensions																					
	Motor Frame Size	hp	rpm	A mm	B mm	C mm	D1 mm	F mm	G mm	H mm	K mm	K1 mm	L mm	L1 mm	M mm	N mm	P mm	V mm	W mm	MIN.Y mm	MAX.Y mm	Z mm
0.7	180M	12.7	956	187.3	168	2	54	171.4	157	15.3	100	90	42	70	84	28	112	250	36	27	51	3
	180L	16	958	187.3	168	2	54	171.4	157	20.3	100	110	42	70	84	28	112	315	46	27	51	3
1.3	225L	26	730	215.9	178	2	64	196.8	181	18.7	125	110	55	90	84	28	112	315	46	38	64	3
3	250L	43	732	260.3	215	3	70	235	221	18.9	140	140	60	105	107	35	142	400	60	49	73	3
6	280M	63	734	260	231	3	86	240	222	23.5	155	180	75	120	107	35	142	500	81	50	85	3
	280L	82	735	260	231	3	86	240	222	23.5	185	180	75	120	107	35	142	500	81	50	85	3
12	355L	123	590	338	284.5	3.5	109	312	280	23.5	205	180	95	135	132	40	172	500	102	72	109	3
	400L	170	590	338	324.5	3.5	109	312	280	25.5	205	225	100	155	167	45	212	630	102	72	109	5
18	400LX	228	591	392	341	4	125	360	320	26	205	225	100	155	167	45	212	630	118	80	125	5
	450L	300	592	392	341	4	125	360	320	26	215	225	110	170	167	45	212	630	118	80	125	5

The motor ratings are taken for Periodic Duty Classes S4 and S5, 150 starts per hour with a cyclic duration factor at 40%. For motors operating outside these ratings, consult Renold Hi-Tec Couplings

# PM Mill Motor Couplings

## Type PM-SMM dimensions table (AISE Motor)

### Series 6 mill motors

Coupling Size	Motor Frame Size	hp	rpm	Dimensions																		
				A mm	B mm	C mm	D1 mm	F mm	G mm	H mm	K mm	K1 mm	L mm	L1 mm	M mm	N mm	P mm	V mm	W mm	MIN.Y mm	MAX.Y mm	Z mm
0.4	602	7	800	161.9	153	1	51	146	133	13.5	102	83	44.45	76.2	70	31	101	203	36	22	41	3
0.7	603	10	725	187.3	172	2	54	171.4	157	15.3	121	95	50.80	88.9	83	33	116	254	39	27	51	3
	604	15	650	187.3	172	2	54	171.4	157	15.3	121	95	50.80	88.9	83	33	116	254	39	27	51	3
1.3	606	25	575	215.9	196	2	64	196.8	181	18.7	133	146	63.50	101.6	95	35	130	330	46	38	64	3
3	608	35	525	260.3	219	3	70	235	221	18.9	171	146	76.20	123.8	111	35	146	330	60	49	73	3
6	610	50	500	260	237	3	86	240	222	18.5	178	171	82.55	127	111	37	148	406	81	50	85	3
12	612	75	475	338	281.5	3.5	109	312	280	18.5	190	222	92.07	158.7	124	45	169	483	102	72	109	3
	614	100	460	338	281.5	3.5	109	312	280	18.5	216	222	107.95	158.7	124	45	169	483	102	72	109	3
18	616	150	450	392	318	4	125	360	320	21	241	286	117.47	181	137	52	189	584	118	80	125	5
27	618	200	410	440	336.5	4.5	143	407	367	21	254	286	127.00	203.2	149	40	189	584	134	92	143	5
	620	275	390	440	336.5	4.5	143	407	367	21	305	286	149.22	228.6	168	51	219	584	134	92	143	5
	622	375	360	440	392.5	4.5	143	407	367	21	305	286	158.75	228.6	178	67	245	584	152.7	92	143	5
40	624	500	340	490	466	5	162	458	418	21	305	286	177.80	228.6	232	67	299	584	152.7	105	162	5

### Series 8 mill motors

Coupling Size	Motor Frame Size	hp	rpm	Dimensions																		
				A mm	B mm	C mm	D1 mm	F mm	G mm	H mm	K mm	K1 mm	L mm	L1 mm	M mm	N mm	P mm	V mm	W mm	MIN.Y mm	MAX.Y mm	Z mm
0.4	802	7.5	800	161.9	153	1	51	146	133	13.5	102	83	44.45	76.2	70	31	101	203	36	22	41	3
	802	10	800	161.9	153	1	51	146	133	15.3	102	95	44.45	76.2	70	31	101	254	36	22	41	3
0.7	803	15	725	187.3	172	2	54	171.4	157	15.3	121	95	50.80	88.9	83	33	116	254	39	27	51	3
1.3	804	20	650	215.9	182	2	64	196.8	181	18.7	121	146	50.80	88.9	83	33	116	330	46	38	64	3
3	806	30	575	260.3	203	3	70	235	221	18.9	133	146	63.50	101.6	95	35	130	330	60	49	73	3
	808	50	525	260.3	219	3	70	235	221	18.5	171	171	76.20	123.8	111	35	146	406	60	49	73	3
6	810	70	500	260	237	3	86	240	222	18.5	178	171	82.55	127	111	37	148	406	81	50	85	3
12	812	100	475	338	281.5	3.5	109	312	280	18.5	190	222	92.07	158.7	124	45	169	483	102	72	109	3
	814	150	460	338	281.5	3.5	109	312	280	18.5	216	222	107.95	158.7	124	45	169	483	102	72	109	3
18	816	200	450	392	318	4	125	360	320	21	241	286	117.47	181	137	52	189	584	118	80	125	5
27	818	250	410	440	336.5	4.5	143	407	367	21	254	286	127.00	203.2	149	40	189	584	134	92	143	5

## PM Technical Data

### 1.1 Prediction of the system torsional vibration characteristics.

An adequate prediction of the system torsional vibration characteristics can be made by the following method.

**1.1.1** Use the torsional stiffness as published in the catalogue which is based upon data measured at a 30°C ambient temperature.

**1.1.2** Repeat the calculation made as 1.1.1 but using the maximum temperature correction factor  $S_{t100}$  and  $M_{100}$  for the rubber selected for both torsional stiffness and dynamic magnifier from the table below.

$$C_{T100} = C_{T30} \times S_t$$

Rubber Grade	Temp <sub>max</sub>	S <sub>t</sub>
SM 60	100	$S_{t100} = 0.60$
SM 70	100	$S_{t100} = 0.44$
SM 80	100	$S_{t100} = 0.37$

**SM 60 is considered "standard"**

Rubber Grade	Dynamic Magnifier at 30°C (M <sub>30</sub> )	Dynamic Magnifier at 100°C (M <sub>100</sub> )
SM 60	8	10.67
SM 70	6	9.53
SM 80	4	6.9

**SM 60 is considered "standard"**

**1.1.3** Review the calculations 1.1.1 and 1.1.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue, the coupling is then considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range the actual temperature of the coupling will need to be calculated.

### 1.2 Prediction of the actual coupling temperature and torsional stiffness

**1.2.1** Use the torsional stiffness as published in the catalogue, which is based upon data measured at 30°C and the dynamic magnifier at 30°C. (M<sub>30</sub>)

**2.2.2** Compare the synthesis value of the calculated heat load in the coupling (P<sub>K</sub>) at the speed of interest to the "Allowable Heat Dissipation" (P<sub>KW</sub>).

The coupling temperature rise  

$$^{\circ}\text{C} = \text{Temp}_{\text{coup}} = \left( \frac{P_K}{P_{KW}} \right) \times 70$$

The coupling temperature = J

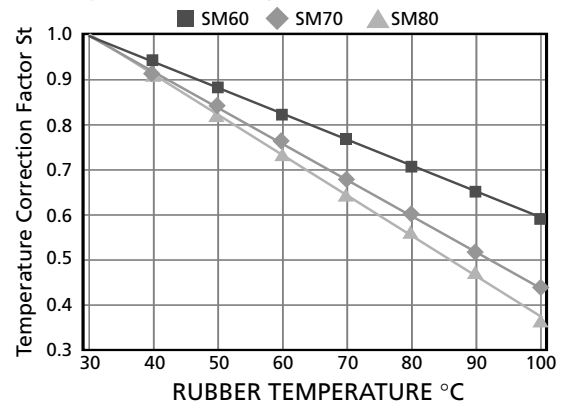
$$J = \text{Temp}_{\text{coup}} + \text{Ambient Temp.}$$

**1.2.3** Calculate the temperature correction factor S<sub>t</sub> from 1.3 (if the coupling temperature > 100°C, then use S<sub>t100</sub>). Calculate the dynamic Magnifier as per 1.4. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier

**1.2.4** Calculate the coupling temperature as per 1.2. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

### 1.3 Temperature Correction Factor

### 1.4 Dynamic Magnifier Correction



#### Factor

The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t}$$

$$\varphi_T = \varphi_{30} \times S_t$$

Rubber Grade	Dynamic Magnifier (M <sub>30</sub> )	Relative Damping $\varphi_{30}$
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57

**SM 60 is considered "standard"**

## PM Technical Data - Standard Blocks

### PM 0.4 - PM 130

Coupling Size	kW/rpm	Max. Torque T <sub>kmax</sub> (kNm)	Vibratory Torque T <sub>kw</sub> (kNm) (2)	Allowable Dissipated Heat at Amb. Temp. 30°C P <sub>kw</sub> (W)	Max. Speed (rpm)
0.4	0.045	0.43	0.054	266	7200
0.7	0.07	0.67	0.084	322	6300
1.3	0.14	1.3	0.163	365	5400
3	0.32	3.0	0.375	458	4500
6	0.63	6.0	0.75	564	4480
8	0.84	8.0	1.0	562	3860
12	1.25	12.0	1.5	670	3450
18	1.89	18.0	2.25	798	2975
27	2.83	27.0	3.375	870	2650
40	4.19	40.0	5.0	1018	2380
60	6.28	60.0	7.5	1159	2050
90	9.43	90.0	11.25	1209	1830
130	13.62	130.0	16.25	1369	1600

**Coupling**
**Dynamic Torsional (3) Stiffness (MNm/rad)**

Coupling Size	@ 0.25 T <sub>KN</sub>			@ 0.50 T <sub>KN</sub>			@ 0.75 T <sub>KN</sub>			@ 1.0 T <sub>KN</sub>		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
0.4	0.003	0.005	0.009	0.005	0.007	0.010	0.008	0.009	0.012	0.011	0.012	0.014
0.7	0.005	0.008	0.013	0.008	0.010	0.015	0.012	0.014	0.018	0.018	0.018	0.021
1.3	0.012	0.018	0.030	0.019	0.025	0.036	0.029	0.033	0.043	0.043	0.044	0.051
3	0.029	0.043	0.072	0.046	0.058	0.086	0.069	0.078	0.102	0.102	0.105	0.122
6	0.104	0.148	0.192	0.148	0.198	0.258	0.220	0.284	0.378	0.320	0.396	0.546
8	0.139	0.197	0.256	0.197	0.264	0.344	0.293	0.379	0.504	0.427	0.528	0.728
12	0.208	0.296	0.384	0.296	0.396	0.516	0.440	0.568	0.756	0.640	0.792	1.092
18	0.312	0.444	0.576	0.444	0.594	0.774	0.660	0.852	1.134	0.960	1.188	1.638
27	0.468	0.666	0.864	0.666	0.891	1.161	0.990	1.278	1.701	1.440	1.782	2.457
40	0.693	0.987	1.280	0.987	1.320	1.720	1.467	1.893	2.520	2.133	2.640	3.640
60	1.040	1.480	1.920	1.480	1.980	2.580	2.200	2.840	3.780	3.200	3.960	5.460
90	1.560	2.220	2.880	2.220	2.970	3.870	3.300	4.260	5.670	4.800	5.940	8.190
130	2.253	3.207	4.160	3.207	4.290	5.590	4.767	6.153	8.190	6.933	8.580	11.83

**Coupling**
**Radial Stiffness (N/mm)**
**Axial Stiffness (N/mm)**
**Max. Axial Force (N)**

Coupling Size	@ No Load						@ 50% T <sub>kmax</sub>						@ 50% T <sub>kmax</sub> (1)		
	Radial Stiffness			Axial Stiffness			Radial Stiffness			Axial Stiffness			Max. Axial Force		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
0.4	685	1070	1740	1430	1760	2510	458	753	1040	920	1100	1250	66	78	85
0.7	723	1130	1820	1510	1860	2650	502	828	1160	1050	1360	1450	72	80	106
1.3	1240	1950	3210	2600	3200	4480	714	1180	1670	1540	1920	2060	102	112	148
3	2050	3240	5190	4300	5240	7450	970	1610	2230	2020	2610	2750	128	140	185
6	6276	8400	11400	13180	13800	16500	1060	2748	4120	2300	2750	4120	1501	1648	2237
8	6966	9320	12650	14630	15320	18320	1176	3050	4573	2500	3050	4570	1668	1825	2482
12	7980	10680	14500	16780	17550	20980	1347	3495	5240	2920	3500	5240	1913	2099	2845
18	9140	12230	16600	19200	20100	24000	1543	4000	6000	3310	4000	6000	2178	2374	3257
27	10460	14000	19000	21970	23000	27500	1766	4580	6867	3830	4580	6870	2502	2747	3728
40	11069	15960	21660	25050	26220	31350	2010	5220	7828	4360	5220	7830	2845	3139	4265
60	12680	18280	24810	28700	30040	35910	2306	5980	8968	4980	5980	8970	3267	3581	4866
90	14500	20916	28200	32820	34360	41100	2638	6840	10260	5720	6840	10260	3728	4101	5572
130	16400	23646	32100	37110	38850	46450	2980	7740	11600	6460	7740	11600	4218	4640	6298

(1) The couplings will 'slip' axially when the maximum axial force is reached.

(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies  $f_e = \text{Vib. Torque} \sqrt{\frac{10\text{Hz}}{f_e}}$

$$\sqrt{\frac{10\text{Hz}}{f_e}}$$

(3) These values should be corrected for rubber temperature as shown in the design information section

$$T_{KN} = \frac{T_{KMAX}}{3}$$



## PM Technical Data - Standard Blocks

### PM 180 - PM 6000

Coupling Size	kW/rpm	Max. Torque T <sub>kmax</sub> (kNm)	Vibratory Torque T <sub>kw</sub> (kNm) (2)	Allowable Dissipated Heat at Amb. Temp. 30°C P <sub>kw</sub> (W)	Max. Speed (rpm)
180	18.86	180.0	22.5	1526	1460
270	28.29	270.0	33.75	1735	1260
400	41.91	400.0	50.00	1985	1090
600	62.86	600.0	75.00	2168	975
900	94.2	900.0	112.5	4803	975
1300	136.2	1300.0	162.5	5427	860
1800	188.6	1800.0	225	6052	770
2700	282.8	2700.0	337.5	6932	680
4000	419.1	4000.0	500	7899	600
6000	628.6	6000.0	750	11849	520

Coupling Size	Dynamic Torsional (3) Stiffness (MNm/rad)											
	@ 0.25 T <sub>KN</sub>			@ 0.50 T <sub>KN</sub>			@ 0.75 T <sub>KN</sub>			@ 1.0 T <sub>KN</sub>		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
180	3.120	4.440	5.760	4.440	5.940	7.740	6.600	8.520	11.34	9.600	11.88	16.38
270	4.680	6.660	8.640	6.660	8.910	11.61	9.600	12.78	17.01	14.40	17.82	24.57
400	6.933	9.867	12.80	9.768	13.20	17.20	14.67	18.93	25.20	21.33	26.40	36.40
600	10.40	14.80	19.20	14.80	19.80	25.80	22.0	28.40	37.80	32.00	39.60	54.60
900	-	8.1	9.45	-	11.7	16.2	-	17.3	20.9	-	23.6	26.8
1300	-	11.7	13.65	-	16.9	23.4	-	25.0	30.2	-	34.1	38.7
1800	-	16.2	18.9	-	23.4	32.4	-	34.7	41.9	-	47.2	53.5
2700	-	24.3	28.4	-	35.1	48.6	-	52.0	62.8	-	70.9	80.3
4000	-	36.0	42.0	-	52.0	72.0	-	77.0	93.0	-	105.0	119.0
6000	-	54.0	63.0	-	78.0	108.0	-	115.5	139.5	-	157.5	178.5

Coupling Size	Radial Stiffness (N/mm)						Axial Stiffness (N/mm)						Max. Axial Force (N)		
	@ No Load			@ 50% T <sub>kmax</sub>			@ No Load			@ 50% T <sub>kmax</sub>			@ 50% T <sub>kmax</sub> (1)		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
180	18270	26350	35750	41350	43290	51760	3324	8620	12924	7200	8620	12920	4709	5160	7014
270	20920	30170	40945	47350	49560	59260	3800	9870	14800	8240	9870	14800	5396	5915	8025
400	23820	34340	46600	53890	56420	67460	4332	11230	16844	9380	11230	16840	6131	6730	9143
600	27300	39370	53400	61780	64680	77330	4966	12880	19310	10760	12880	19310	7034	7720	10477
900	-	28174	46048	-	-	-	-	1234	1966	-	-	-	-	-	-
1300	-	31837	52035	-	-	-	-	1395	2222	-	-	-	-	-	-
1800	-	35501	58024	-	-	-	-	1555	2477	-	-	-	-	-	-
2700	-	40661	66458	-	-	-	-	1781	2837	-	-	-	-	-	-
4000	-	46337	75735	-	-	-	-	2029	3233	-	-	-	-	-	-
6000	-	69505	113601	-	-	-	-	3044	4849	-	-	-	-	-	-

- (1) The couplings will 'slip' axially when the maximum axial force is reached.  
 (2) At 10Hz only, allowable vibratory torque at higher or lower frequencies  $f_e = \text{Vib. Torque} \sqrt{\frac{10\text{Hz}}{f_e}}$

(3) These values should be corrected for rubber temperature as shown in the design information section

$$T_{KN} = \frac{T_{KMAX}}{3}$$

## PM Technical Data - Special Round Blocks

### PM 12 - PM 600

Coupling Size	kW/rpm	Nominal Torque T <sub>KN</sub> (kNm)	Max. Torque T <sub>Kmax</sub> (kNm)	Vibratory Torque T <sub>Kv</sub> (kNm) (2)	Allowable Dissipated Heat at Amb. Temp. 30°C P <sub>kw</sub> (W)	Max. Speed (rpm)
12	1.25	3.2	12.0	1.0	130	3450
18	1.89	4.8	18.0	1.5	150	2975
27	2.83	7.2	27.0	2.25	180	2650
40	4.19	10.67	40.0	3.334	220	2380
60	6.28	15.99	60.0	5.0	260	2050
90	9.43	24.0	90.0	7.5	300	1830
130	13.62	34.67	130.0	10.833	340	1600
180	18.86	48.0	180.0	15.0	375	1460
270	28.29	72.0	270.0	22.5	440	1260
400	41.91	106.67	400.0	29.0	490	1090
600	62.86	159.99	600.0	42.75	565	975

#### Coupling

#### Dynamic Torsional (3) Stiffness (MNm/rad)

Coupling Size	@ 0.25 T <sub>KN</sub>			@ 0.50 T <sub>KN</sub>			@ 0.75 T <sub>KN</sub>			@ 1.0 T <sub>KN</sub>		
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80
12	0.053	0.072	0.1	0.088	0.104	0.159	0.168	0.162	0.214	0.285	0.256	0.328
18	0.08	0.109	0.149	0.132	0.155	0.239	0.251	0.243	0.321	0.427	0.385	0.491
27	0.12	0.163	0.224	0.198	0.233	0.358	0.337	0.364	0.481	0.641	0.577	0.737
40	0.18	0.241	0.322	0.293	0.345	0.53	0.559	0.539	0.713	0.948	0.855	1.092
60	0.27	0.362	0.498	0.44	0.52	0.796	0.84	0.809	1.069	1.424	1.282	1.638
90	0.613	0.895	0.747	0.791	1.05	1.193	1.154	1.317	1.603	1.91	1.85	2.457
130	0.885	1.293	1.079	1.143	1.517	1.724	1.667	1.902	2.316	2.759	2.672	3.549
180	1.226	1.79	1.493	1.582	2.1	2.387	2.308	2.634	3.207	3.82	3.7	4.913
270	1.839	2.685	2.24	2.373	3.15	3.58	3.462	3.951	4.81	5.73	5.55	7.37
400	2.724	3.978	3.319	3.516	4.667	5.304	5.129	5.853	7.126	8.489	8.222	10.919
600	4.087	5.967	4.98	5.273	7	7.956	7.693	8.78	10.689	12.733	12.333	16.378

#### Coupling

#### Radial Stiffness (N/mm)

#### Axial Stiffness (N/mm)

Max. Axial Force (N)

Coupling Size	@ No Load			@ T <sub>kn</sub>			@ No Load			@ T <sub>kn</sub>			@ T <sub>kn</sub> (1)
	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60	SM70	SM80	SM60
12	2619	3742	6138	9510	9056	9132	1122	1495	2545	2918	3067	3218	2943
18	3000	4286	7030	10900	10374	10460	1285	1710	2915	3340	3510	3686	3335
27	3433	4905	8044	12470	11870	11968	1470	1960	3335	3825	4020	4218	3728
40	3914	5592	9170	14215	13530	13644	1675	2234	3800	4360	4580	4808	4415
60	4497	6425	10538	16300	15550	15678	1925	2568	4368	5010	5266	5526	5003
90	5132	7333	12025	18640	17745	17892	2198	2930	4986	5718	6000	6306	5690
130	5798	8284	13586	21000	20048	20214	2482	3310	5632	6460	6790	7124	6475
180	6464	9236	15147	23480	22350	22535	2768	3690	6278	7200	7570	7942	7161
270	7398	10570	17335	26870	25580	25790	3168	4220	7187	8242	8660	9090	8240
400	8438	12050	19770	30650	29176	29410	3613	4818	8197	9400	9880	10368	9418
600	9657	13798	22628	35070	33390	33666	4135	5514	9380	10750	11300	11865	10791

(1) The couplings will 'slip' axially when the maximum axial force is reached for SM60, SM70 and SM80 grades of rubber.

(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies  $f_e = \text{Vib. Torque} \sqrt{\frac{10\text{Hz}}{f_e}}$

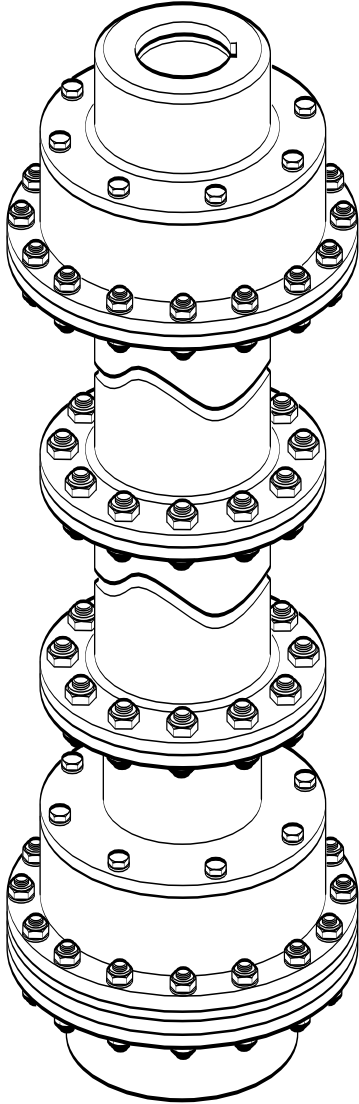
$$\sqrt{\frac{10\text{Hz}}{f_e}}$$

(3) These values should be corrected for rubber temperature as shown in the design information section

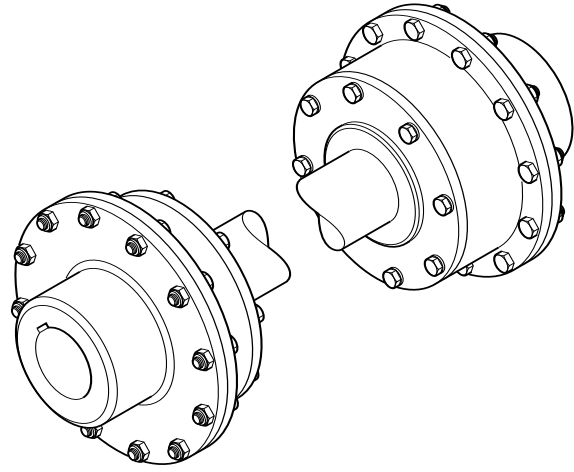
## PM Design Variations

The PM coupling range can be adapted to meet customer needs. Below are some of the arrangements that have been produced.

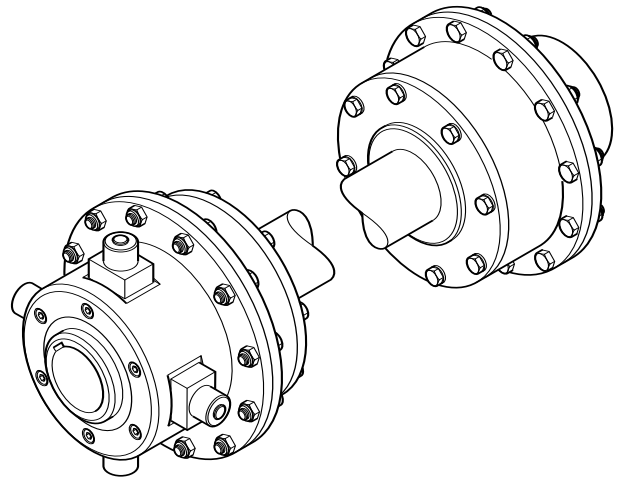
For a more comprehensive list contact Renold Hi-Tec Couplings.



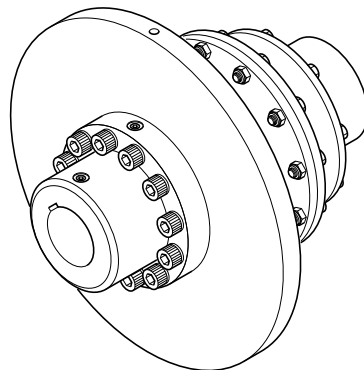
Cardan shaft coupling with thrust bearings to support the drive line on vertical applications.



Cardan shaft coupling used to increase the distance between shaft ends and give a higher misalignment capability.



Combination with a torque limiting device to prevent damage to driving and driven machine under shock loads.



Coupling with a brake disc for use on cranes, fans and conveyor drives.

## Coupling Selection Checklist

Photocopy this page and complete the following check list to ensure the correct coupling selection is achieved, then fax it to

the Renold Hi-Tec Couplings Sales Fax Line below for a speedy response.

<b>Customer:</b>	
<b>Project:</b>	
<b>Prime mover:</b> (see page 86)	<b>Service factor:</b>
<b>Driven equipment:</b> (see page 87)	<b>Service factor:</b>
<b>Continuous power:</b>	<b>Maximum power:</b>
<b>Operating speed:</b>	<b>Overspeed:</b>
<b>Driving shaft diameter:</b>	<b>Driven shaft diameter:</b>
<b>Driving shaft length:</b>	<b>Driven shaft length:</b>
<b>Flywheel location diameter:</b>	<b>Hole size and PCD:</b>
<b>Continuous misalignment:</b>	<b>Transient misalignment:</b>
<b>Diameter constraints:</b>	<b>Length constraints:</b>
<b>Distance between shaft ends:</b>	

**If you require help with coupling selections contact Renold Hi-Tec Couplings:**

**Tel: +44 (0) 1422 255000**

**Fax: +44 (0) 1422 255100**

## Selection Procedure

- From the continuous Power (P) and operating Speed (n) calculate the Application Torque T<sub>NORM</sub> from the formula:

$$T_{NORM} = 9549 \times (P/n) \text{ Nm}$$

- Select Prime Mover Service Factor (Fp) from section 3.0.
- Select Driven Equipment Service Factor (Fm) from section 4.
- The minimum Service Factor has been set at 1.5.
- Calculate T<sub>MAX</sub> from the formula:

$$T_{MAX} = T_{NORM} (Fp + Fm)$$

- Select Coupling such that T<sub>MAX</sub> < T<sub>KMAX</sub>
- Check n < Coupling Maximum Speed (from catalogue data).
- Check Coupling Bore Capacity such that d<sub>min</sub> < d < d<sub>max</sub>.
- Consult the factory for alternatives if catalogue limits are exceeded.

N.B. If you are within 80% of maximum speed, dynamic balancing is required.

- T<sub>NORM</sub> = Application Torque (Nm)
- T<sub>MAX</sub> = Peak Application Torque (Nm)
- T<sub>KN</sub> = Nominal Coupling Rating according to DIN 740 (kNm)  
(with service factor = 3 according to Renold Hi-Tec Couplings standard)
- T<sub>Kmax</sub> = Maximum Coupling Rating according to DIN 740 (kNm)
- P = Continuous Power to be transmitted by coupling (kW)
- n = Speed of coupling application (rpm)
- Fp = Prime Mover Service Factor
- Fm = Driven Equipment Service Factor
- d<sub>max</sub> = Coupling maximum bore (mm)
- d<sub>min</sub> = Coupling minimum bore (mm)

**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.

### Prime mover service factors

Prime Mover Factors		Fp
Diesel Engine	1 Cylinder	*
	2 Cylinder	*
	3 Cylinder	2.5
	4 Cylinder	2.0
	5 Cylinder	1.8
	6 Cylinder	1.7
More than	6 Cylinder	1.5
Vee Engine		1.5
Petrol Engine		1.5
Turbine		0
Electric Motor		0
Induction Motor		0
Synchronous Motor		1.5
Variable Speed*		
Synchronous Converter (LCI)	- 6 pulse	1.0
	- 12 pulse	0.5
PWM/Quasi Square		0.5
Cyclo Converter		0.5
Cascade Recovery (Kramer, Scherbius)		1.5

\*The application of these drive types is highly specialised and it is recommended that Renold Hi-Tec Couplings is consulted for further advice.  
The final selection should be made by Renold Hi-Tec Couplings.

For confirmation of coupling selection complete the check list on page 87 and fax to Renold Hi-Tec Couplings.  
Fax: +44 (0) 1422 255100

## Driven Equipment Service Factors

Application	Typical Driven Equipment Factor(Fm)	Application	Typical Driven Equipment Factor(Fm)	Application	Typical Driven Equipment Factor(Fm)
<b>Agitators</b>		<b>Generators</b>		- belt	1.5
Pure liquids	1.5	Alternating	1.5	- bucket	1.5
Liquids and solids	2.0	Not welding	1.5	- chain	1.75
Liquids-variable density	2.0	Welding	2.2	- screw	1.5
<b>Blowers</b>		<b>Hammer mills</b>	4.0	Dinthead	3.0
Centrifugal	1.5			Fan - ventilation	2.0
Lobe (Rootes type)	2.5	<b>Lumber industry</b>		Haulages	2.0
Vane	2.0	Barkers - drum type	3.0	Lump breakers	1.5
<b>Brewing and Distilling</b>		Edger feed	2.5	Pulverisor	2.0
Bottling machinery	1.5	Live rolls	2.5	Pump - rotary	2.0
Lauter Tub	1.75	Log haul-incline	2.5	- ram	3.0
<b>Briquetter Machines</b>	3.0	Log haul-well type	2.5	- reciprocating	3.0
<b>Can filling machines</b>	1.5	Off bearing rolls	2.5	- centrifugal	1.5
<b>Cane knives</b>	3.0	Planer feed chains	2.0	Roadheader	2.0
<b>Car dumpers</b>	3.0	Planer floor chains	2.0	Shearer - Longwall	2.0
<b>Car pullers - Intermittent Duty</b>	2.5	Planer tilting hoist	2.0	Winder Colliery	2.5
<b>Clay working machinery</b>	2.5	Sawing machine	2.0		
<b>Compressors</b>		Slab conveyor	2.0	<b>Mixers</b>	
Axial Screw	1.5	Sorting table	2.0	Concrete mixers	2.0
Centrifugal	1.5	Trimmer feed	2.0	Drum type	2.0
Lobe	2.5	<b>Metal Manufacture</b>		<b>Oil industry</b>	
Reciprocating - multi-cylinder	3.0	Bar reeling machine	2.5	Chillers	2.0
Rotary	2.0	Crusher-ore	4.0	Oil well pumping	3.0
<b>Conveyors - uniformly loaded or fed</b>		Feed rolls	*	Paraffin filter press	2.0
Apron	2.0	Forging machine	2.0	Rotary kilns	2.5
Assembly	1.5	Rolling machine	*	<b>Paper mills</b>	
Belt	1.5	Roller table	*	Barker-auxiliaries hydraulic	3.0
Bucket	2.0	Shears	3.0	Barker-mechanical	3.5
Chain	2.0	Tube mill (pilger)	*	Barking drum (Spur Gear only)	3.5
Flight	2.0	Wire Mill	2.0	Beater and pulper	3.5
Oven	2.5	<b>Metal mills</b>		Bleacher	2.0
Screw	2.0	Drawn bench - carriage	2.5	Calenders	2.0
<b>Conveyors - heavy duty not uniformly fed</b>		Drawn bench - main drive	2.5	Chippers	2.5
Apron	2.0	Forming machines	2.5	Coaters	2.0
Assembly	2.0	Slitters	2.0	Converting machine (not cutters, platers)	2.0
Belt	2.0	Table conveyors - non-reversing	*	Couch	2.0
Bucket	2.5	- reversing	*	Cutters, platers	3.0
Chain	2.5	Wire drawing and flattening machine	2.0	Cylinders	2.0
Flight	2.5	Wire winding machine	2.0	Dryers	2.0
Oven	2.5	<b>Metal rolling mills</b>		Felt stretcher	2.0
Reciprocating	3.0	Blooming mills	*	Felt whipper	2.0
Screw	3.0	Coilers - hot mill & cold mill	2.5	Jordans	2.25
Shaker	4.0	Cold mills	*	Line shaft	2.0
<b>Crane &amp; hoists</b>		Cooling mills	*	Log haul	2.5
All motions	3.0	Door openers	2.0	Presses	2.5
<b>Crushers</b>		Draw benches	2.5	Pulp grinder	3.5
Ore	3.0	Edger drives	2.5	Reel	2.0
Stone	3.5	Feed rolls, reversing mills	*	Stock chests	2.0
Sugar (1)	3.5	Furnace pushers	2.5	Suction roll	2.0
<b>Dredgers</b>		Hot mills	*	Washers and thickeners	2.0
Cable reels	2.5	Ingot cars	2.0	Winders	2.0
Conveyors	2.0	Manipulators	3.0	<b>Printing presses</b>	2.0
Cutter head drives	3.5	Merchant mills	*	<b>Propellers</b>	
Jig drives	3.5	Piercers	3.0	Marine - fixed pitch	2.0
Manoeuvring winches	3.0	Pushers rams	2.5	- controllable pitch	2.0
Pumps	3.0	Reel drives	2.0	<b>Pullers</b>	
Screen drive	3.0	Reel drums	2.0	Barge haul	2.5
Stackers	3.0	Bar mills	*	<b>Pumps</b>	
Utility winches	2.0	Roughing mill delivery table	*	Centrifugal	1.5
<b>Dynamometer</b>	1.5	Runout table	*	Reciprocating - double acting	3.0
<b>Elevators</b>		Saws - hot, cold	2.0	single acting - 1 or 2 cylinders	3.0
Bucket	3.0	Screwdown drives	2.5	3 or more cylinders	3.0
Centrifugal discharge	2.0	Skelp mills	*	Rotary - gear, lobe, vane	2.0
Escalators	1.5	Slitters	2.0	<b>Rubber industry</b>	
Freight	2.0	Slabbing mills	*	Mixed - banbury	3.0
Gravity discharge	2.0	Soaking pit cover drives	2.5	Rubber calender	2.0
<b>Fans</b>		Straighteners	3.0	Rubber mill (2 or more)	2.5
Centrifugal	1.5	Table transfer & runabout	2.5	Sheeter	2.5
Cooling towers	2.0	Thrust block	3.0	Tyre building machines	2.5
Forced draft	2.0	Traction drive	2.0	Tyre and tube press openers	2.0
Induced draft (without damper control)	2.0	Tube conveyor rolls	2.0	Tubers and strainer	2.5
<b>Feeders</b>		Unscramblers	2.5	<b>Screens</b>	
Apron	2.0	Wire drawing	2.0	Air washing	1.5
Belt	2.0	<b>Mills, rotary type</b>		Grizzly	2.5
Disc	2.0	Ball	2.5	Rotary, stone or gravel	2.0
Reciprocating	3.0	Cement kilns	2.5	Travelling water intake	1.5
Screw	2.0	Dryers and coolers	2.5	Vibrating	2.5
		Kilns	2.5	<b>Sewage disposal equipment</b>	2.0
		Hammer	3.5	<b>Textile industry</b>	2.0
		Pebble	2.5	<b>Windless</b>	2.5
		Pug	3.0		
		Rod	2.5		
		Tumbling barrels	2.5		
		<b>Mining</b>			
		Conveyor - armoured face	3.0		

\* Use 1.75 with motor cut-out power rating

## Selection Examples

### Example 1

- Selection of 6 Cylinder Diesel Engine 750 kW at 900 rpm driving a Centrifugal Pump.

The coupling is flywheel mounted  
Pump shaft diameter = dm

$$\begin{aligned}
 P &= 750 \text{ kW} & n &= 900 \text{ rpm} \\
 dm &= 95 \text{ mm} & \text{temp} &= 30^\circ\text{C} \\
 F_p &= 1.7 & F_m &= 1.5 \\
 T_{\text{NORM}} &= (P/n) \times 9549 \text{ Nm} \\
 &= (750/900) \times 9549 \text{ Nm} \\
 &= 7.958 \text{ kNm} \\
 T_{\text{MAX}} &= T_{\text{NORM}} (F_p + F_m) \\
 &= 7.958 (1.7 + 1.5) \\
 &= 25.466 \text{ kNm}
 \end{aligned}$$

- The application is considered light industrial and RB type coupling should be selected. Examination of RB catalogue shows RB 3.86 as:

$$T_{K_{\text{max}}} = 27.4 \text{ kNm} \quad T_{K_N} = 9.159 \text{ kNm}$$

which satisfies the condition

- $T_{\text{MAX}} < T_{K_{\text{max}}}$  (25.466 < 27.4) kNm
- $T_{\text{NORM}} < T_{K_N}$  (7.859 < 9.159) kNm
- $n < \text{Coupling Maximum Speed}$  (900 < 2500) rpm
- $d_{\text{min}} < d_m < d_{\text{max}}$  (80 < 95 < 170) mm

### Calculation Service

- For over 40 years we have been the world leader in torsional vibration analysis for all types of machinery and have developed sophisticated in-house computer programmes specifically for this purpose.



### Example 2

- Selection of Induction Motor 800 kW at 1498 rpm driving a Rotary Pump.

Motor shaft = dp	Pump shaft = dm
P = 800 kW	n = 1498 rpm
dp = 95 mm	dm = 85 mm
temp = 30°C	Fp = 0
Fm = 2	
T <sub>NORM</sub> = (P/n) x 9549 Nm	
= (800/1498) x 9549 Nm	
= 5.1 kNm	
T <sub>MAX</sub> = T <sub>NORM</sub> (Fp + Fm)	
= 5.1 (0 + 2) kNm	
= 10.2 kNm	

- The application requires a steel coupling (by customer specification) and PM type coupling should be selected. Examination of PM catalogue shows PM12 as:

$$T_{K_{\text{max}}} = 12 \text{ kNm}$$

which satisfies the condition

- $T_{\text{MAX}} < T_{K_{\text{max}}}$  (10.2 < 12.0) kNm
- $n < \text{Coupling Maximum Speed}$  (1498 < 3450) rpm
- $d_{\text{min}} < d_p < d_{\text{max}}$  (72 < 95 < 109) mm
- $d_{\text{min}} < d_m < d_{\text{max}}$  (72 < 85 < 109) mm

- A consultancy service is also available to customers in the selection of the correct product for their specific application.
- Renold Hi-Tec Couplings is well known in the diesel engine industry for its analysis techniques.
- In the heavy industrial sector, Renold Hi-Tec Couplings' engineers have made many torsional vibration analyses. For example, steady state transient and Torque Amplification Factors (TAF) on electric motor drivelines in cement mills, rolling mills, compressor drive trains, synchronous motor start ups and variable frequency (LCI, Kramer/Scherbius/PWM) applications.
- On page 91, two examples of torsional vibration analysis that are produced by Renold Hi-Tec Couplings' engineers are shown.

# Transient Analysis

## Calculated Examples

Illustrated below are two different types of transient torsional vibrations analysis that can be produced by Renold Hi-Tec Couplings' engineers.

This ensures optimum solutions are reached by the correct selection of torsional stiffness and damping characteristics of the coupling.

Whilst the synchronous resonance and synchronous convertor (LCI) examples are shown, other applications Renold Hi-Tec Couplings has experience of include Torque Amplification, electrical speed control devices, PWM, Scherbius/Kramer, short-circuit and any re-connection of electrical circuits on the mechanical systems.

### Example 1

Since June 1962 we have engineered flexible couplings for Synchronous Motor applications to reduce by damping, the damaging vibratory torques imposed into the system when accelerating through the first resonant frequency.

**Table A**

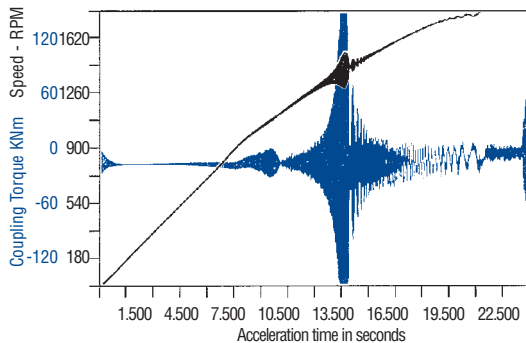


Table A shows vibrating torque experienced in the motor shaft when the system is connected rigidly (or by a gear or membrane coupling) to the driven system.

**Table B**

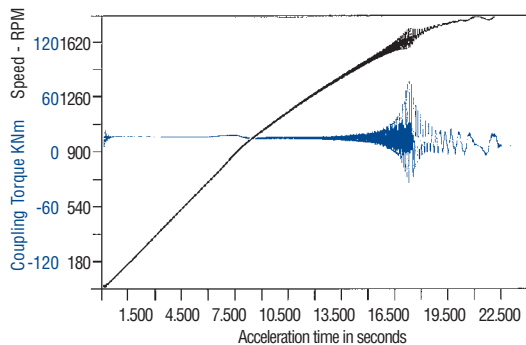


Table B shows the same system connected by a DCB coupling. A PM type coupling is also used in such applications.

### Example 2

From 1981 we have been engineering flexible couplings for Synchronous Convertor (LCI) drives to control the forced mode conditions through the first natural frequency by judicious selection of torsional stiffness and damping.

**Table C**

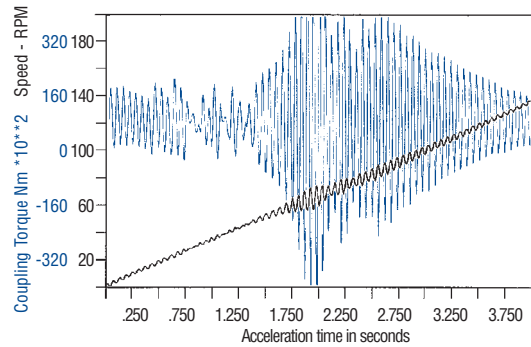


Table C shows a typical motor/fan system connected rigidly (or through a gear or membrane coupling) when damaging torques would have been experienced in the motor shaft.

**Table D**

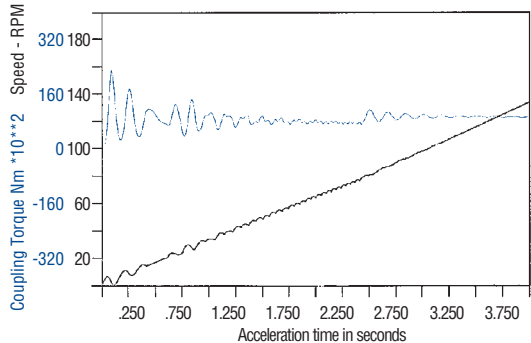


Table D shows the equivalent Renold Hi-Tec Couplings engineered solution using a PM coupling.



## Rubber Information

The rubber blocks and elements used in Renold Hi-Tec Couplings are key elements in the coupling design. Strict quality control is

applied in the manufacture, and frequent testing is part of the production process.

### Rubber-in-Compression

These designs use non-bonded components, which allows for many synthetic elastomers to be employed.

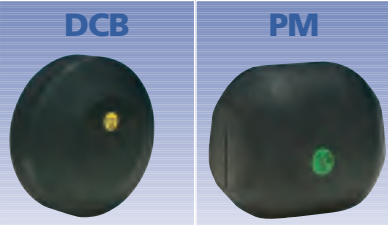





























These elastomers offer considerable advantages over others for specific applications, giving Renold Hi-Tec Couplings a distinctive lead in application engineering in specialised areas.

### Rubber in Shear

These designs use high tear strength, low creep natural rubber developed for diesel engine drives.

All rubber in shear couplings are 100% tested to ensure bond/moulding integrity.

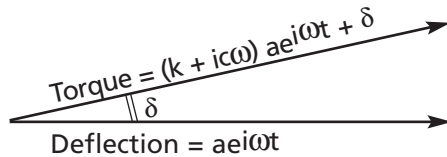
### Rubber Compound

Identification label	Natural Red (F, NM)	Styrene- Butadiene Green (SM)	Neoprene Yellow (CM)	Nitrile White (AM)	Styrene- Butadiene Blue* (S)
Resistance to Compression Set	Good	Good	Fair	Good	Fair
Resistance to Flexing	Excellent	Good	Good	Good	Good
Resistance to Cutting	Excellent	Good	Good	Good	Fair
Resistance to Abrasion	Excellent	Good	Good	Good	Good
Resistance to Oxidation	Fair	Fair	Very Good	Good	Fair
Resistance to Oil & Gasoline	Poor	Poor	Good	Good	Poor
Resistance to Acids	Good	Good	Fair	Fair	Good
Resistance to Water Swelling	Good	Good	Good	Good	Good
Service Temp. Maximum; Continuous	80°C	100°C	100°C	120°C	100°C
Service Temperature Minimum	-50°C	-40°C	-30°C	-40°C	-40°C
* High Damping					
<b>Rubber Block Types</b>					
	NM	SM	CM	AM	S
	      	    	      	    	 S12  S19  S28  S33

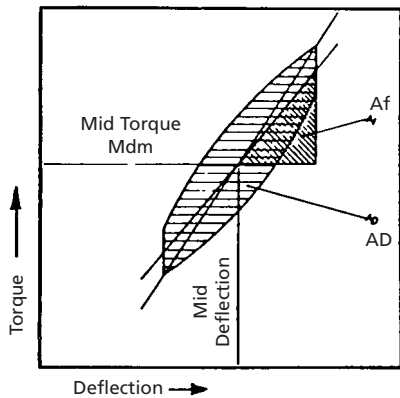
## Damping Characteristics

Coupling damping varies directly with torsional stiffness and inversely with frequency for a given rubber grade. This relationship is conventionally described by the dynamic magnifier M, varying with hardness for the various rubber types.

$$M = \frac{K}{C\omega}$$



$$\tan \delta = \frac{C\omega}{K} = \frac{1}{M}$$



$$\psi = \frac{AD}{Af} = \frac{2\pi}{M}$$

This property may also be expressed as the Damping Energy Ratio or Relative Damping, which is the ratio of the damping energy, AD, produced mechanically by the coupling during a vibration cycle and converted into heat energy, to the flexible strain energy Af with respect to the mean position.

- Where
- C = Specific Damping (Nms/rad)
  - K = Torsional Stiffness (Nm/rad)
  - $\omega$  = Frequency (Rad/s)
  - M = Dynamic Magnifier
  - $\delta$  = Phase Angle Rad
  - $\psi$  = Damping Energy Ratio

The rubber compound dynamic magnifier values are shown in the table below.

Rubber grade	M
NM 45	15
SM 50	10
SM60	8
SM70	6
SM 80	4

## Product Range


The products comprise of rubber in compression and rubber in shear couplings, developed over 40 years for the complete range of diesel and industrial applications.

**RENOLD Hi-Tec Couplings** deliver the durability, reliability and long life that customers demand.


In particular our design capability and innovation is recognised in


customising couplings to meet exacting requirements.

**RENOLD Hi-Tec Couplings** is "the complete solution".

	<h3>RB Range</h3> <p>General purpose, cost effective range available in either shaft to shaft or flywheel to shaft configurations with a maximum torque of 41 kNm.</p>	
	<table border="0"> <tr> <td> <b>Applications</b> <ul style="list-style-type: none"> <li>● Generator and Pump Sets</li> <li>● Compressors</li> <li>● Metal manufacture</li> <li>● Bulk Handling</li> <li>● Pulp and Paper Industry</li> <li>● General Industrial Applications</li> </ul> </td> <td> <b>Benefits</b> <ul style="list-style-type: none"> <li>● Control of Resonant Torsional Vibration</li> <li>● Intrinsically Fail Safe Operation</li> <li>● Maintenance Free</li> <li>● Zero Backlash</li> <li>● Lowest Lifetime Cost</li> <li>● Misalignment Capability</li> </ul> </td> </tr> </table>	<b>Applications</b> <ul style="list-style-type: none"> <li>● Generator and Pump Sets</li> <li>● Compressors</li> <li>● Metal manufacture</li> <li>● Bulk Handling</li> <li>● Pulp and Paper Industry</li> <li>● General Industrial Applications</li> </ul>
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<h3>PM Range</h3> <p>This range of couplings is specially designed for heavy industrial applications providing exceptional protection against severe shock loads and vibration. Maximum torque 6000 kNm.</p>		
<table border="0"> <tr> <td> <b>Applications</b> <ul style="list-style-type: none"> <li>● Metal manufacture</li> <li>● Mining</li> <li>● Pumps, Fans and Compressors</li> <li>● Cranes and Hoists</li> <li>● Power Generation</li> <li>● Pulp and Paper Industry</li> <li>● General Heavy Duty Industrial Applications</li> </ul> </td> <td> <b>Benefits</b> <ul style="list-style-type: none"> <li>● Severe Shock Load Protection</li> <li>● Intrinsically Fail Safe Operation</li> <li>● Maintenance Free</li> <li>● Vibration Control</li> <li>● Zero Backlash</li> <li>● Misalignment Capability</li> <li>● Lowest Lifetime Cost</li> </ul> </td> </tr> </table>		<b>Applications</b> <ul style="list-style-type: none"> <li>● Metal manufacture</li> <li>● Mining</li> <li>● Pumps, Fans and Compressors</li> <li>● Cranes and Hoists</li> <li>● Power Generation</li> <li>● Pulp and Paper Industry</li> <li>● General Heavy Duty Industrial Applications</li> </ul>
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	<h3>DCB Range</h3> <p>The unrivalled quality and endurance capability designed into every DCB coupling make it ideally suited for marine propulsion, power generation and reciprocating compressor applications where long life, fail safe operation and control of resonant torsional vibrations are essential. Maximum torque range 5520 kNm.</p>	
	<table border="0"> <tr> <td> <b>Applications</b> <ul style="list-style-type: none"> <li>● Marine Propulsion</li> <li>● High Power Generator Sets</li> <li>● Reciprocating Compressors</li> </ul> </td> <td> <b>Benefits</b> <ul style="list-style-type: none"> <li>● Control of Resonant Torsional Vibration</li> <li>● Intrinsically Fail Safe Operation</li> <li>● Long Life</li> <li>● Misalignment Capability</li> <li>● Zero Backlash</li> <li>● Severe Shock Load Protection</li> </ul> </td> </tr> </table>	<b>Applications</b> <ul style="list-style-type: none"> <li>● Marine Propulsion</li> <li>● High Power Generator Sets</li> <li>● Reciprocating Compressors</li> </ul>
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	<h3>MSC Range</h3> <p>This innovative coupling has been designed to satisfy a vast spectrum of diesel drive and compressor applications providing low linear stiffness and control of resonant torsional vibration with intrinsically fail safe operation. Maximum torque 375 kNm.</p>	
	<table border="0"> <tr> <td> <b>Applications</b> <ul style="list-style-type: none"> <li>● Marine Propulsion</li> <li>● High Power Generator Sets</li> <li>● Compressors</li> </ul> </td> <td> <b>Benefits</b> <ul style="list-style-type: none"> <li>● Low Linear Stiffness</li> <li>● Intrinsically Fail Safe Operation</li> <li>● Control of Resonant Torsional Vibration</li> <li>● High Heat Capacity</li> <li>● Large Misalignment Capability</li> <li>● Noise Attenuation</li> <li>● Radial Removal of Rubber Elements</li> </ul> </td> </tr> </table>	<b>Applications</b> <ul style="list-style-type: none"> <li>● Marine Propulsion</li> <li>● High Power Generator Sets</li> <li>● Compressors</li> </ul>
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## Product Range

### LKB Range

The LKB coupling has been designed as a low stiffness, blind assembly coupling for connecting diesel engines to driven equipment in a broad range of applications. Maximum torque 30 kNm.

#### Applications

- Marine Propulsion
- High Power
- Compressors
- Pumps

#### Benefits

- Unique Blind Assembly
- Control of Resonant Torsional Vibration
- Low Linear Stiffness
- Noise Attenuation
- Zero Backlash



### HTB Range

The HTB Coupling is a high temperature, blind assembly coupling designed for mounting inside bell housings. Maximum torque 60 kNm

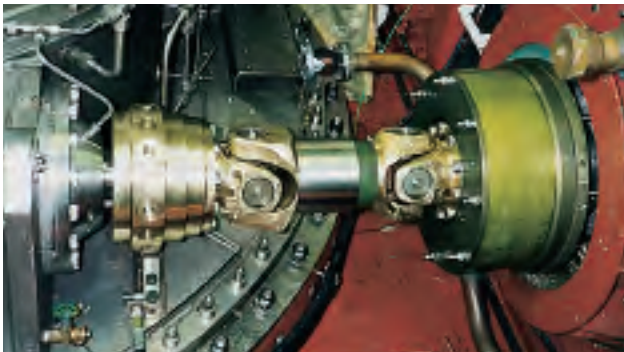
#### Applications

- Marine Propulsion
- Compressors
- Generators and pump sets
- Rail Traction

#### Benefits

- Unique blind assembly
- High temperature capacity (up to 200°C)
- Severe shock load protection
- Intrinsically fail safe
- Noise attenuation

## Special Couplings



### Coupling type

- Universal joint shaft coupling
- Limited end float coupling
- Torque limiting couplings
- Clutch couplings
- Disc and drum brakes
- Aluminium coupling
- Cardan shaft coupling

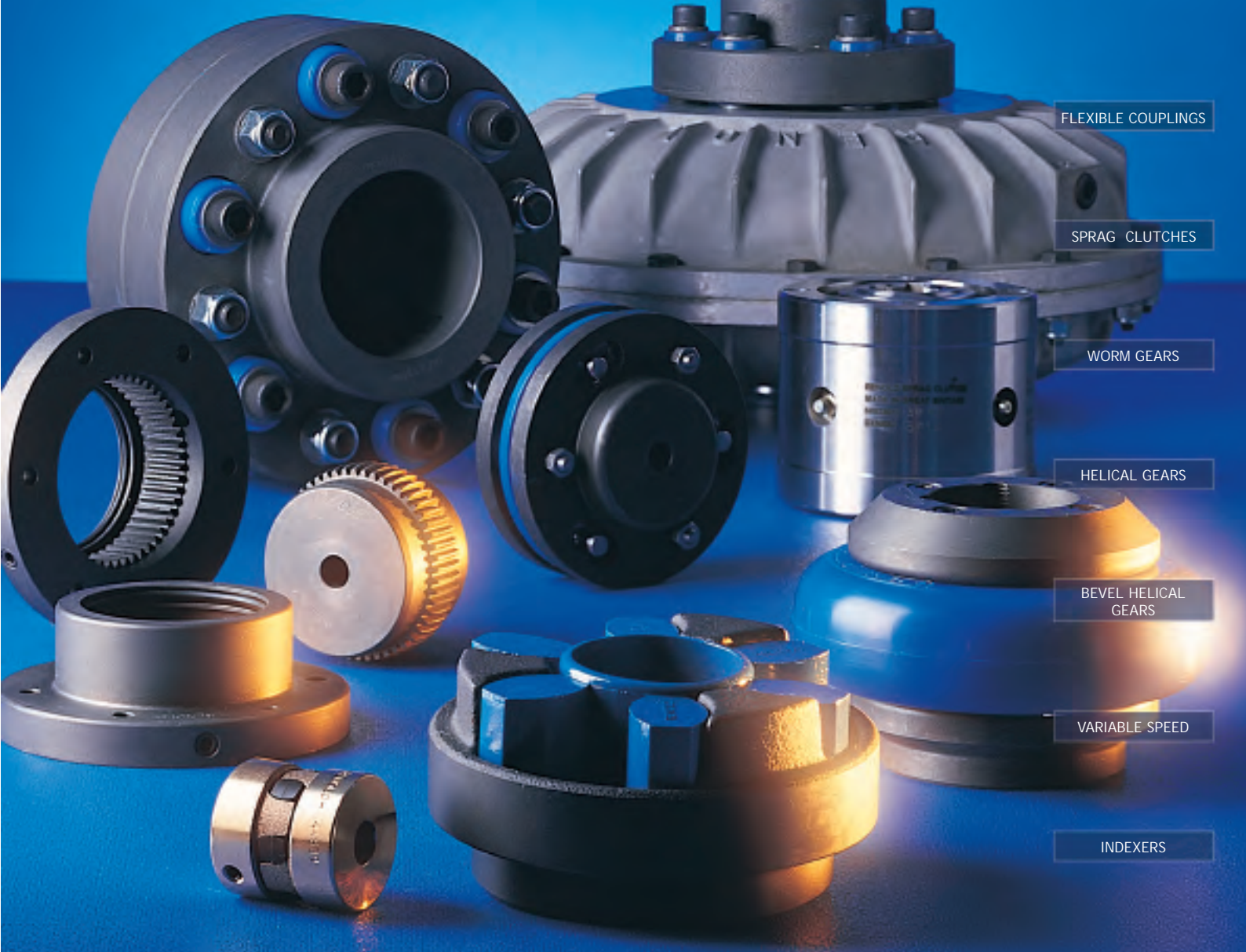
Renold Hi-Tec Couplings has a unique capability to design and manufacture special couplings.

Finite element analysis, computer modelling and extensive testing facilities can be used to design and manufacture couplings to suit all applications.

Extensive rubber manufacturing expertise allows couplings with special properties to be made, from fire resistant materials to highly elastic noise attenuating compounds.

### Benefits

- Introduces torsional flexibility while accepting the sinusoidal loads from the UJ shaft
- Limits the axial movement on machines without axial location
- Protects driving and drive machines from shock and overload torques
- Allows the drive to be engaged and disengaged easily
- Allows the drive to be slowed, stopped or held in position
- Anti-magnetic and lightweight
- Gives high misalignment capability and gives increased distance between shaft ends



FLEXIBLE COUPLINGS

SPRAG CLUTCHES

WORM GEARS

HELICAL GEARS

BEVEL HELICAL GEARS

VARIABLE SPEED

INDEXERS

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