Discflex Couplings

RENOLD
Superior Coupling Technology

www.renold.com

RENOLD

Strength through Service

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

Interchangeability

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

Custom Made

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

Available

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

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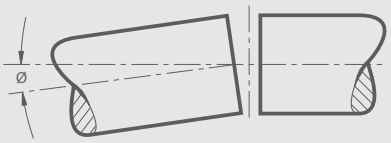
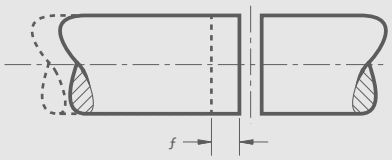
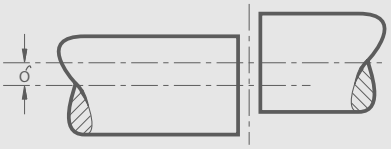
Coupling Selection Guide



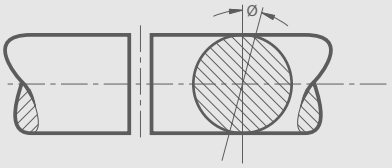
Angular



End float



Parallel offset



Torsional flexibility

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5. Selection Power Ks = K x fD x fS

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

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

Load Classification by Application

Table 1

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

Key

S = Steady

M = Medium Impulsive

H = Highly Impulsive

* = Refer to Renold

(1) = Select on 24 hours per day service factor only.

(2) = Use service factor of 1.00 for any duration of service.

(3) = Use service factor of 1.25 for any duration of service.

(4) = Use service factor of 1.50 for any duration of service.

Note

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

Service Factors and Selection

Table 2 Service Factor (f_D)

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

Table 3 Factor for Starts/Hour(f_S)

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

Example of Selection

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

K = 7.5kW

From Table 1 Load Classification = M (medium impulsive)

From Table 2 Service Factor f_D = 1.5

From Table 3 f_S = 1.2

Therefore selection kW is:-

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

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

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

$= 0.9375$kW @ 100RPM

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

Key Stress

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

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

   r = 55/2 = 27.5mm ÷ 1000 = 0.0275m

   F = 49.7/0.0275 = 1741N

   A = 16 x 45 = 720mm^2

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

   Selection is therefore good.

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

WARNING

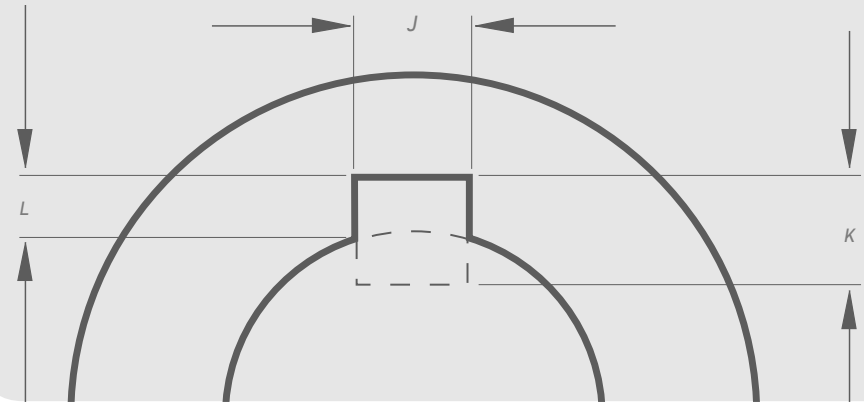
It is the responsibility of the system designer to ensure that the application of the coupling does not endanger the other constituent components in the system. Service factors given are an initial selection guide.

WARNING

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

Key and Keyway Dimensions

[*fig 01*]



Metric (mm)

Keyways comply with BS4235: Part 1: 1972

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

Imperial (inches)

Keyways comply with BS46: Part 1: 1958

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

Keyway dimensions [*fig 01*]

Parallel keyways are supplied unless customer states otherwise.

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 and 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 comprises

- Shaft to Shaft

Applications

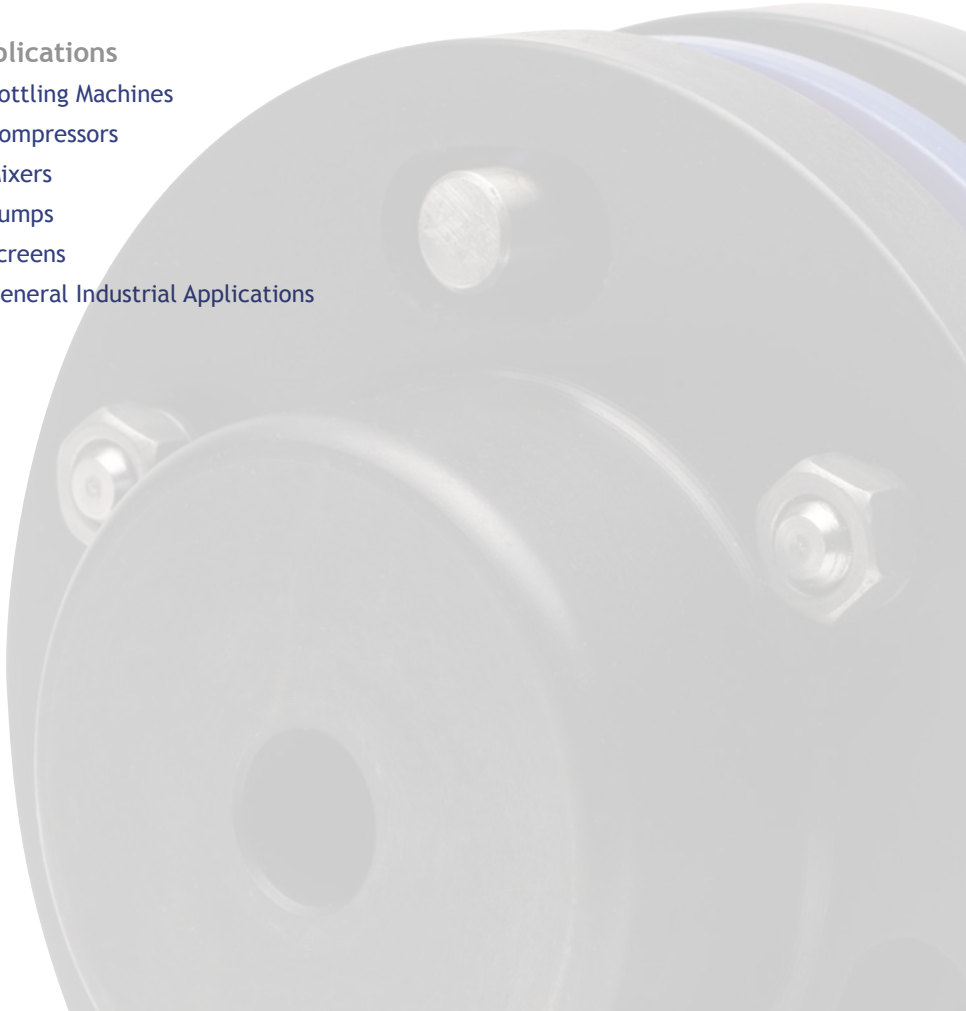
- Bottling Machines
- Compressors
- Mixers
- Pumps
- Screens
- General Industrial Applications

Construction details

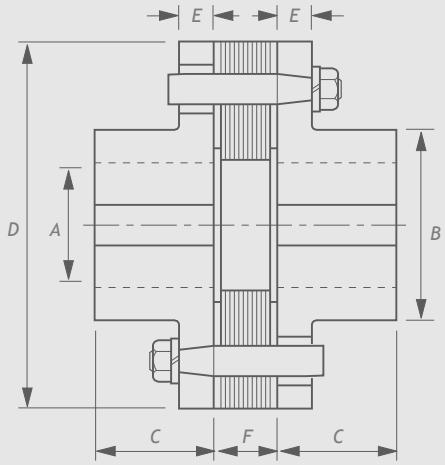
Cast Iron Half Bodies

Urethane Disc
Temp Range -40 to +80°C

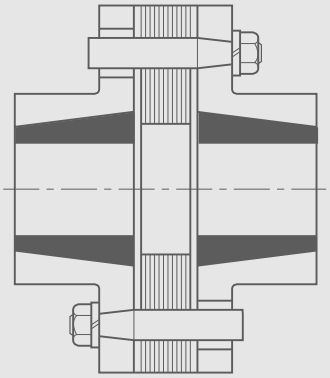
Rubber Reinforced Disc
Temp Range -40 to +90°C



Discflex



Type B



Type F

Catalogue 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 offset misalignment 0.5mm

Discflex

Ordering code

D 52 # # # #

- Discflex
- Size
- Half body type
  - B - Plain bore
  - F - Taper bush
- Disc size*
  - N - Narrow
  - S - Standard
  - W - Wide
- Half body type
  - B - Plain bore
  - F - Taper bush
- Buffer half type
  - P - Polyurethane
  - R - Rubber/fabric

* 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 taped 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

The best range of solution chain products available anywhere

RENOLD Synergy™

- High performance
- Superior wear life
- Outstanding fatigue resistance

RENOLD Syno™

- Maintenance free
- Self-lubricating chain
- Food industry-approved lubricant

RENOLD

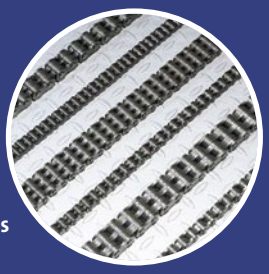
- Best premium chain
- Leading performance
- Solid bush / solid roller / end softened pin

Hydro-Service™

- Superior corrosion resistant coating
- Alternative choice to stainless steel chain
- Will not chip or peel
- Hexavalent chrome-free

Steel Pin Bush Roller Chain

- Manufactured to international stds
- Full range of pitch alternatives
- Breaking loads 13 to 900 kN as std
- Attachments to suit varied applications

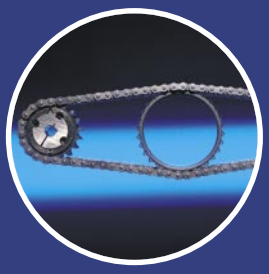


Leaf Chain

- Comprehensive ranges used worldwide for safety critical lifting applications
- 100 years experience in developing and maintaining lifting chain

Steel Knuckle Chain

- Heavy duty, detachable elevator chains
- Integral K type attachments
- Breaking loads from 642kN to 1724kN
- Sealed joint to extend chain life



Roll-Ring™

- Revolutionary chain tensioner
- Installed in seconds and self adjusting
- Maintenance free
- Also acts as noise damper

Customised Engineering Chain

- Wide range to suit specialised applications using high specification materials and treatment processes
- Designed in close collaboration with customer

Smartlink™

- Load monitoring technology
- Technical reports & data logging

RENOLD

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