

Metals Industry



RENOLD

Superior Gear and Coupling Technology

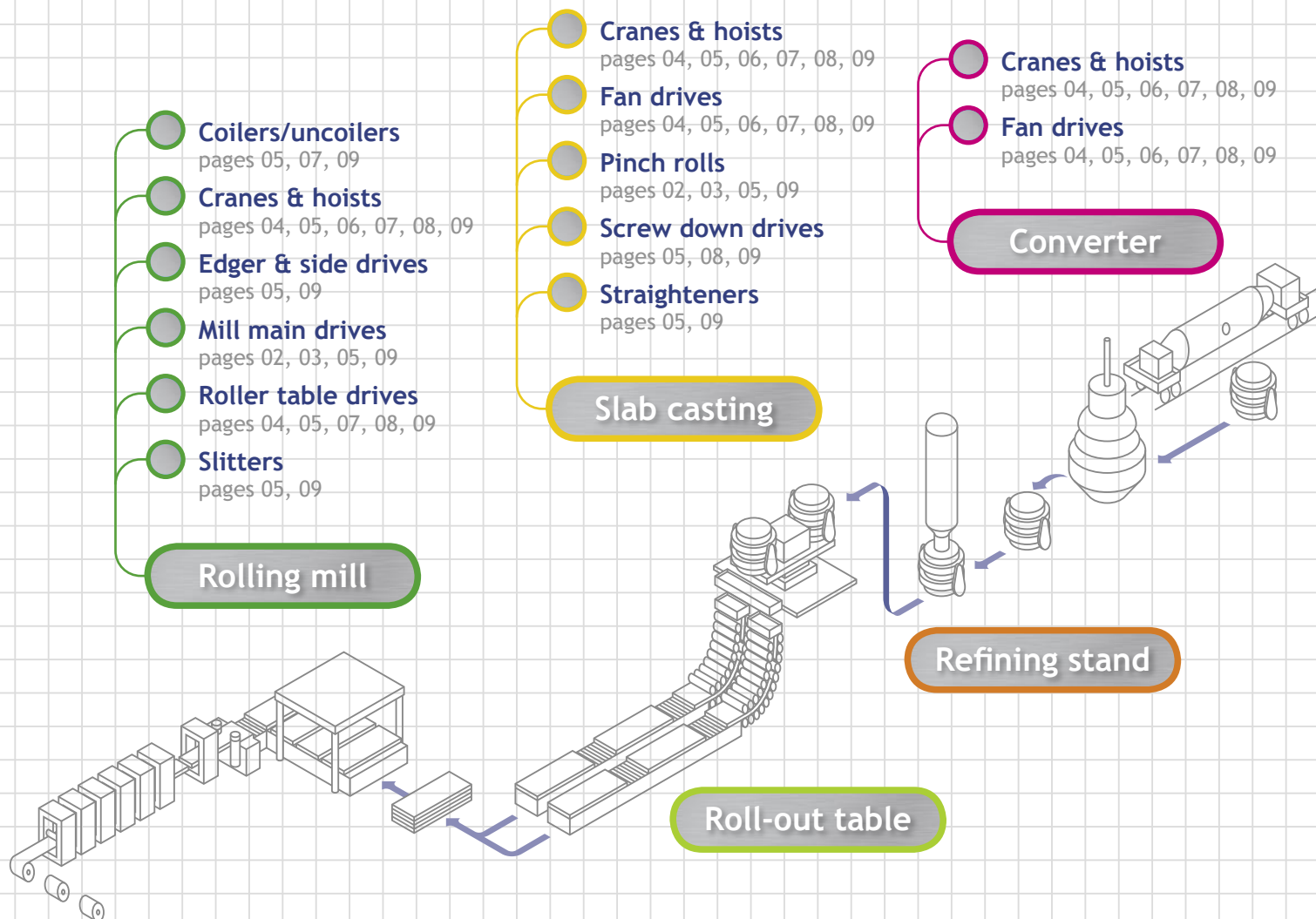
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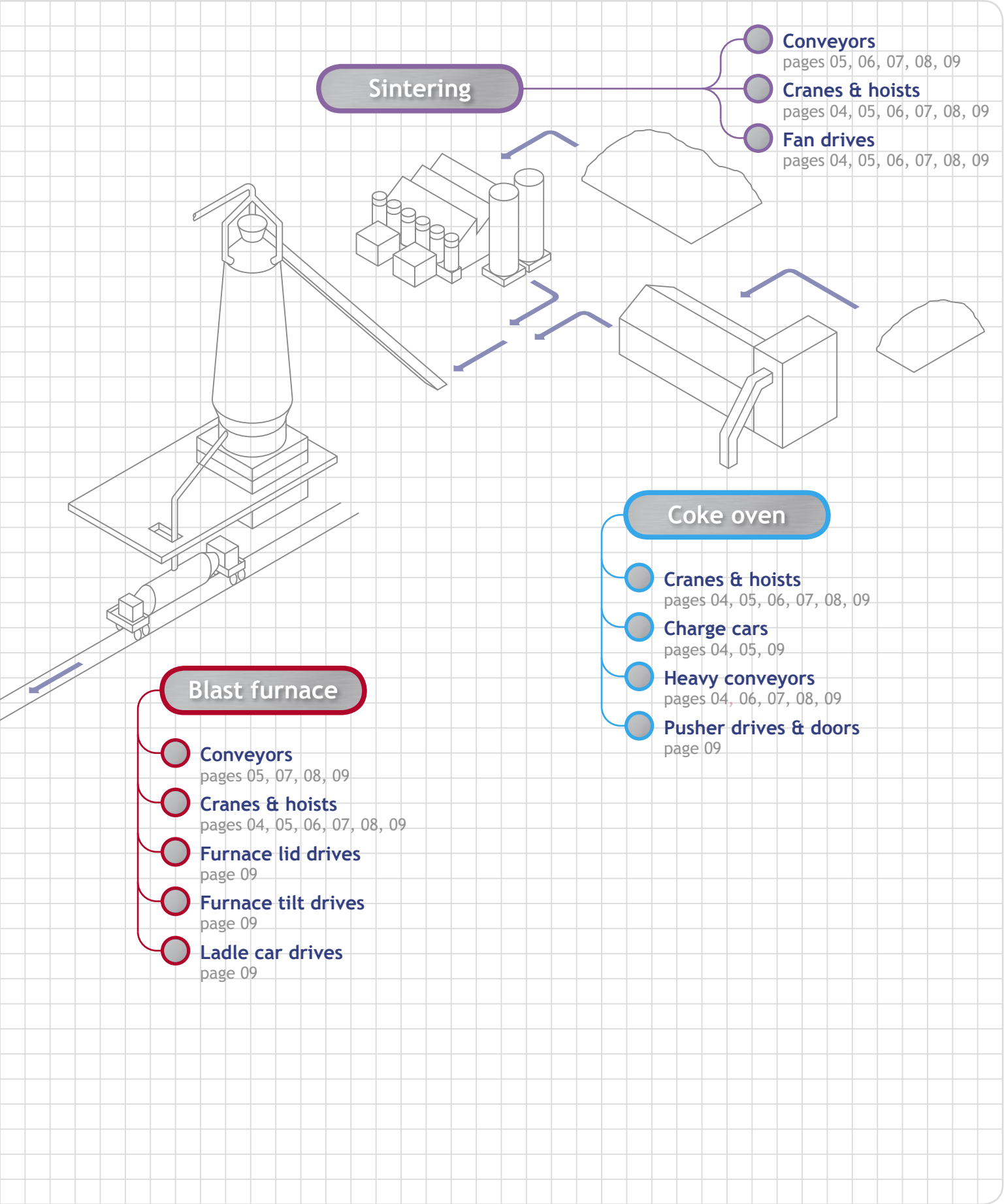
Welcome to the Renold Coupling and Gears Metals Industry Brochure

For over 100 years Renold have supplied the **Steel and Aluminium** manufacturing and processing industries around the World and have always had a reputation for the highest quality products.

Renold Couplings and Gears have one of the best ranges of products from a single supplier for the metals industry whether it is a **Geared Mill Spindle, Coupling, Gearbox or Sprag clutch** (backstop).

Whether it is a standard catalogued product or a customised version to suit your exact needs Renold has the manufacturing expertise to ensure you get the right solution of the highest quality at the right price.





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Geared Mill Spindles

GEAR SPINDLES



Introduction

For more than 60 years, Renold Ajax has been an industry leader in the design and manufacture of custom gear spindles. Our success in the primary metals industry can be attributed to design innovations like continuous oil lubrication, roll-end piloting and compound tooth curvature.

The company has invested heavily in its Westfield, NY, plant with state-of-the-art CNC machinery, continuing research and development, and the latest solid modelling engineering techniques to ensure that customers receive an optimised spindle design for their application.

Design Principles

Four basic 'core' design characteristics balance the cost of the initial investment with the subsequent 'through-life' costs attributed to maintenance and spares.

Type 1 is normally used in smaller mills or those with restrictions on spindle diameter. It features a high torque capacity with maximised pitch diameter. This option is the most economical to purchase but is more costly to maintain long term because ring-gear replacement involves the entire adaptor.

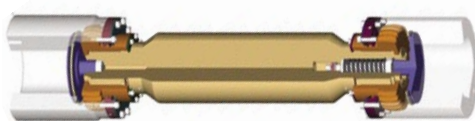
Type 2 provides the same maximum pitch diameter and torque capacity benefits as the Type 1, but utilises a replaceable ring-gear sleeve to reduce maintenance costs.

Type 3 offers the lowest maintenance costs through replaceable ring-gear inserts, but at the expense of torque capacity due to the reduced pitch diameter. The higher initial cost is offset by the economical replacement of the gear elements.

Type 4 combines the benefits of a Type 1 at the roll-end, with Type 3 at the pinion-end and offers a compromise between initial costs and spares. They are typically used when the minimum work roll diameter is much smaller than the pinion box shaft centres.

Features and Benefits

- Cross-flow lubrication ports in the shaft improve accessibility, ensure the thrust buttons are greased and flushes debris from the gear mesh.
- One piece spring plunger eliminates the risk of joint failure associated with a bolted connection.



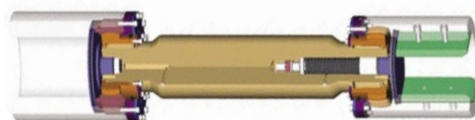
Type 1



Type 2



Type 3



Type 4



- Tight fitting splines preclude any relative motion and resulting wear.
- O-ring seals exist at every spline connection to prevent moisture ingress and any consequent spline corrosion.
- Vented roll-end bore reduces the possibility of clogging and aids roll changing.
- External hub retention enables a quick visual inspection of the connection, and ensures no damaged fasteners can enter the gear mesh.
- Zero-scrub thrust buttons are located on the gearing centre-line, resulting in a pivoting action with no scrubbing. Wear is reduced and no radial force reaction generated.
- Jacking and puller holes allow quick and easy disassembly and handling of all components.
- Tooth tip piloted gearing maintains concentricity under no-load conditions, ensuring equal load sharing when the mill bites. As the maximum load per tooth is reduced the overall capacity of the gear mesh is increased.

Options

Renold Ajax can engineer a number of custom options to extend wear life, reduce maintenance requirements and often improve product quality. These can include:

Continuous Oil Lubrication: Under high compressive stress, the sliding contact of the teeth flanks generates heat that is normally emitted through the OD of the spindle. In order to address the shortcomings of grease lubrication, Renold has developed a circulating oil lubrication system that effectively removes this heat with the additional benefit of flushing debris out of the gear mesh.

Roll-end piloting: To reduce the action in the adaptor bore without affecting the roll change process. The system helps minimise bore wear, reduce vibration and chatter, and improves strip quality. The pilot rings are inexpensive and easily replaced ensuring the adaptor fit can be economically maintained.

Compound curvature: On the tooth flanks maximises the working area of the tooth, reduces stresses and vastly extends wear life without affecting high misalignment angles during roll change.



Renold Hi-Tec

Flexible couplings



RB



General purpose, cost effective range made from SG iron.

Max torque 41000Nm

- Intrinsically failsafe ensuring continuous operation of the driveline in the unlikely event of rubber damage
- Control of resonant torsional vibration means low vibratory loads
- Maintenance free - no lubrication or adjustments required resulting in lower running costs
- Severe shock load protection avoiding failure of the driveline under short circuit/other transient conditions
- Axial and radial misalignment capability
- Zero backlash eliminating torque amplifications through pre-compression of rubber elements
- Spheroidal graphite to BS 2789 Grade 420/12
- Separate rubber elements - choice of grade/hardness
- Enclosed rubber elements loaded in compression

Range options

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

Typical applications

- Heavy duty conveyors
- Cranes and hoists
- Roller table drives
- Fan drives
- Charge cars

PM



Heavy duty rubber in compression coupling.

Max torque 30000kNm

- Severe shock load protection avoiding failure of the driveline under high transient torques
- Intrinsically failsafe ensuring continuous operation of the driveline in the unlikely event of rubber damage
- Maintenance free - no lubrication or adjustments required resulting in low running costs
- Vibration control achieving low vibratory loads
- Zero backlash eliminating torque amplifications through pre-compression of rubber elements
- Axial and radial misalignment capability
- Couplings up to PM18 are manufactured in high strength SG iron
- All sizes above PM18 are manufactured in steel
- Separate rubber elements - choice of grade/hardness
- Enclosed rubber elements loaded in compression

Range options

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

Typical applications

- Heavy duty conveyors
- Cranes and hoists
- Roller table drives
- Fan drives
- Charge cars

Renold Clutches & Couplings

Gear couplings

GEARFLEX



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

Max power @ 100rpm 60402kW

Max torque 5762224Nm

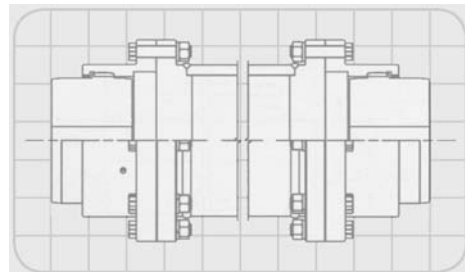
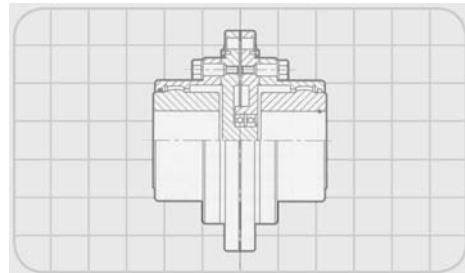
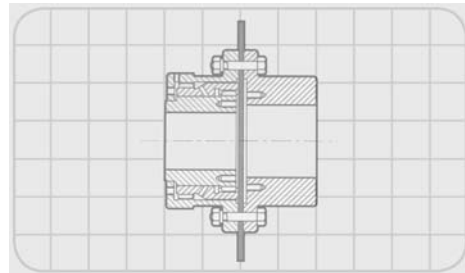
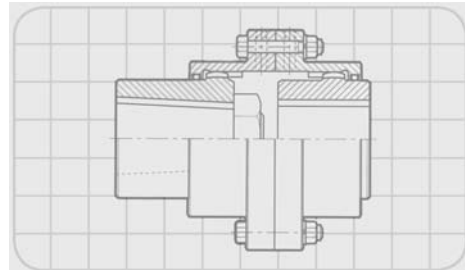
- AGMA standard range - interchangeable and cost effective. Single and double engagement types
- Heavy duty range. Single and double engagement types
- Croft MB series - imperial and metric options. Single and double engagement types
- Ajax 'D' series. High mis-alignment couplings up to 6°
- Unique profiled crowned and barrelled teeth for optimum contact and long life.

Customised options

- Brake disc/drum
- Long hub
- Shear pin
- Telescopic
- Dis-engaging
- Mill motor
- Cardon shaft
- Flange spacer

Typical applications

- Roller table drives
- Edger or side drives
- Conveyors
- Cranes and Hoists
- Coilers/Uncoilers
- Slitters
- Pinch rolls
- Straighteners
- Screw down drives
- Fan drives
- Charge cars



Renold Clutches & Couplings

Pin & bush couplings



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.

Max power @ 100rpm 2611kW

Max torque 249400Nm

- 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

Range options

- Shaft to shaft
- Shear pin
- Brake drum

Typical applications

- Heavy duty conveyors
- Fan drives
- Cranes and Hoists



PINFLEX



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

Max power @ 100rpm 340kW

Max torque 32500Nm

- 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
- Polyurethane buffers, reliable/flexible and temperature resistant
- Taper bores available for ease of maintenance

Range options

- Shaft to shaft
- Shear pin
- Brake drum/disc

Typical applications

- Heavy duty conveyors
- Fan drives
- Cranes and Hoists

Renold Clutches & Couplings

Fluid couplings

HYDRASTART



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

Max power @ 1500rpm 600kW

Max speed 3500rpm

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

Typical applications

- Heavy duty conveyors
- Fan drives



Torsionally rigid couplings

RENOLDFLEX



Renoldflex is a new range of couplings that utilizes a stainless spring steel disc pack to provide a positive 'backlash free' drive.

Max power @ 100rpm 460kW

Max torque 46000Nm

- 100% steel construction
- Torsionally stiff
- Backlash free, ensuring a long life with little or no wear
- Suitable for use in harsh and difficult operating environments including temperatures up to 240°C
- Ideal for high-speed applications
- 100% maintenance free - ideal coupling for harsh, dangerous or remote operating environments

Range Options

- Shaft to Shaft, Flanged Spacer
(up to 3 Metres DBSE)

Typical applications

- Fan drives
- Cranes and hoists
- Conveyors
- Coilers/Uncoilers
- Roller table drives



Renold Clutches & Couplings

Torsionally flexible couplings



TYREFLEX



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

Max power @ 100rpm 66kW
Max torque 6270Nm

- Misalignment capabilities up to 4° - highly flexible
- Shock absorbing - extending machine life
- Interchangeability with no re-engineering
- Maintenance free - minimum number of wearing parts
- Fire retardant, anti-static elements available for use in a flameproof environment
- Spacer option available
- Taper bush bores available for ease of replacement

Range options

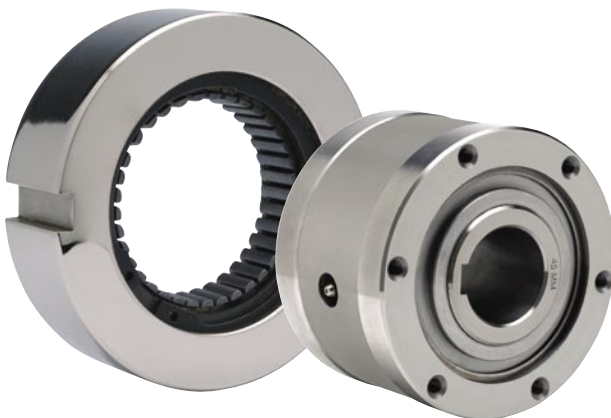
- Shaft to shaft

Typical applications

- Roller table drives
- Fan drives



Clutches / Backstops



SPRAG CLUTCHES



A Sprag Clutch is a free-wheel device having an inner race, and an outer race either of which can be the input or output member. The input member can be arranged to drive the output member in a chosen direction and permit the output member to over-run in the same direction.

In general, Sprag Clutches are able to transmit greater torques, within given overall dimensions, than other types of free-wheel device.

There are 3 basic applications for a sprag clutch: overrunning; indexing; backstopping..

Max torque 759,300 Nm

- Backstop types preventing drive reversals
- Over running and index types
- No backlash giving positive action
- Interchangeability needs no re-engineering
- Sealed for life design reduces maintenance and improves efficiency

Customised Options

- Tension release backstop
- Torque Limiter backstop

Typical applications

- Fan drives
- Screw down drives
- Roller table drives
- Conveyors
- Cranes and hoists

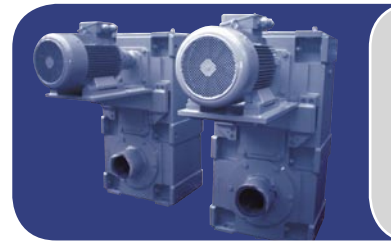
Gears

GEARBOXES



Custom made gearboxes, designed to perform under demanding conditions, class leading helical and wormgear technology.

- Foot mounted wormgear units - interchangeable, low noise, resistance to shock loads
- Shaft mounted geared motor - Fitted with standard IEC and Nema motors
- Helical and Bevel helical units - High efficiency drives
- Mechanical variable speed units - Robust 27:1 stepless speed range.
- Custom made solutions - Gearbox packages designed to fit your application.
- Steel and special casings - High impact applications
- Gearbox servicing - All makes refurbishment to "better than before" specifications.

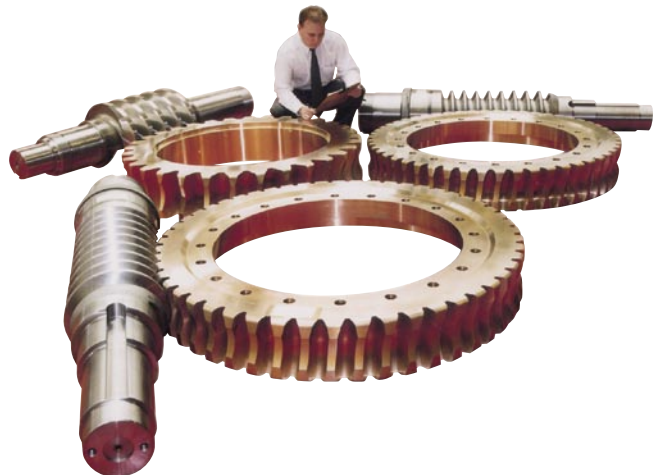


WORM GEARS



Renold is expert in producing high quality custom made Wormshafts and Wormwheels to either commercial or precision grades.

- Holroyd gear profile - Unique high efficiency
- Made to order gears - Designed to customer drawings or samples.
- Large face width gears - Suitable for screw down applications
- Large centre distance gears - High torque applications.
- Heat treated Wormshafts , special material Wormwheels



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