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The Power Transmission Spectrum

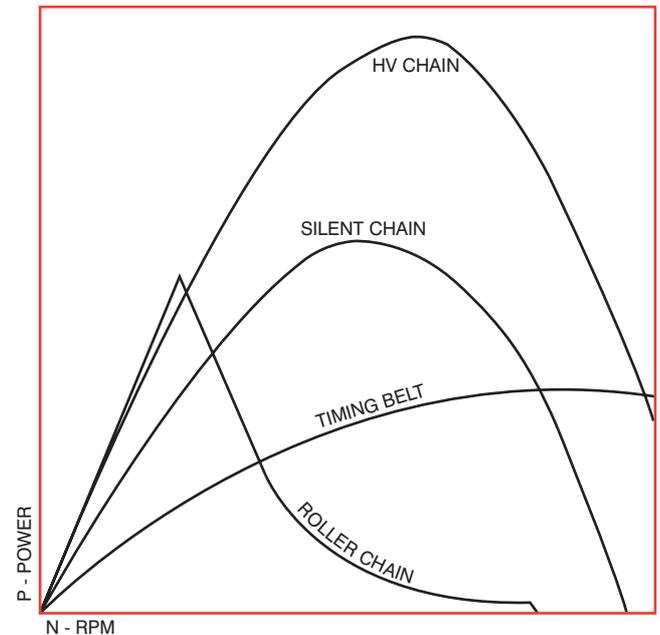
Cross+Morse manufacture and supply a complete line of drives to meet the challenge of modern industry, where ever increasing powers, and speeds are required in production machinery combined with precision timing.

Cross+Morse offer:-

- Roller Chain** - for high torque drives at low to moderate speeds.
- Silent Chain** - for smooth, quiet, medium power drives at higher speeds
- HV Chain** - for maximum power transmission on high speed drives
- Timing Belts** - for light weight, low cost transmissions from medium to very high speeds
- Gears** - for compact centres and right angle drives.

The graph alongside shows a typical power comparison between drives of a similar size. Gears are excluded, as by design they can be manufactured to accommodate a wide range of power and speed combination.

Roller power curve climbs straight and rapidly to a peak in shaft speeds typical of electric motors and gas engines. HV chain picks up after Roller Chain has reached its peak, and continues to provide more than twice power capacity at speeds typical of gas turbines and high speed internal combustion engines. Silent chain offers a compromise for moderate power drives where speed is beyond roller chain, or where a low noise level and smooth drive are required. The timing belt power curve is much lower than chain drives, but continues on to shaft speeds beyond the limit of chain capabilities, offering compact low cost drives.



The Product Range

Precision Roller Chain

Cross+Morse manufacture and supply Precision Roller Chain to ISO Standards types A (ANSI Std) and type B (BS Series) over a pitch range $\frac{1}{4}$ " to 3" in simplex and multi-strand forms. These chains can transmit from fractional powers to over 2,500 kW with chain speeds up to 25 m/s. Roller Chains offer a number of design advantages.

Flexibility of Design

Maximum freedom in selection of shaft centre distances, fixed, or adjustable. Symmetrical design permits engagement with sprocket from either side of chain. Will drive several shafts in either direction from a single shaft. Environmental conditions are not normally critical, and then chain can be simply modified for extreme conditions. In addition to power transmission applications roller chain is frequently used for the transportation of product in conveying applications. A range of attachment plates, and extended pins are normally used with the standard chain on these applications. For longer centre conveyors, double pitch conveying chains are available.

Durability

When the chain wraps around the sprocket, the load is distributed over many pitches so pressures are comparatively low for the power transmitted. The wearing parts are made of high grade, hardened steel. Properly selected and installed, precision roller chain will withstand short term overloads and shock loads, giving long service life.

Efficiency

The positive action of precision roller chain is highly efficient throughout the life of the drive without power loss due to slippage, providing efficiencies of up to 98.5%.

Convenience

Roller chain drive selection is simple and direct. Installation, including centre distance tolerances, does not require the accuracy of other power transmission media. Roller chains can be easily connected or disconnected by standard connecting links; there is no need to disturb sprockets, shafts or bearings to replace chain.

Availability with Low Cost

A very large range of complete standard drives ensures early delivery of drives to suit most installations. Standardisation provides low cost, interchangeability, and availability at all times. For many applications Precision Roller Chain provides the lowest cost solution to drive requirements, with minimal maintenance requirements.

Sprockets and Drive Accessories

A comprehensive range of pilot bored sprockets, chain wheels, and platewheels is available from stock, all of which can be supplied modified to suit customers shafting. For the more popular BS Chain sizes, taper bored sprockets are also available. To complete the drive is a range of self adjusting and rigid tensioners.

Pilot bore sprockets and chainwheels for BS Chains, 05B-1 (8mm) to 32B-3 (2").

Pilot bore sprockets for ANSI Chains, ANSI 35 ($\frac{3}{8}$ ") to ANSI 80 (1").

Stainless steel pilot bore sprockets for BS Chains 06B-1 ($\frac{3}{8}$ ") to 16B-1 (1").

Pilot bore platewheels for BS Chains 06B-1 ($\frac{3}{8}$ ") to 32B-3 (2").

Taper bore sprockets and bushes for BS Chains 06B-1 ($\frac{3}{8}$ ") to 20B-1 (1 $\frac{1}{4}$ ").

Double simplex sprockets for BS Chains 06B-1 to 16B-1.

Idler sprockets for BS Chains 06B-1 to 20B-1.

Spring loaded tensioners and rigid chain adjusters for $\frac{3}{8}$ " to 1 $\frac{1}{2}$ ".

HV Inverted Tooth Chain

Morse HV Chain is ideal for applications where high powers, 30 to 3000 kW, are to be transmitted at moderate to high shaft speeds, 500 to 12,000 r.p.m., and where compact design is required. Offered in 6 pitch sizes and a selection of widths, HV is a highly refined inverted tooth chain providing the smoothness of a belt drive with the compactness, economy, and durability of chain drives. Drive efficiencies of up to 99.7% can be obtained with HV Chain.

HV features a pin and rocker joint which, through its rolling action, reduces friction and provides pitch compensation. The result is reduction of damaging chordal action and a significant increase in horsepower capacity. HV links have more metal at the aperture, a lower crotch, and are shot peened and pre-stressed for greater load carrying capacity.

HV offers three times the power capacity of standard silent chain over a greater speed range. At higher speeds where roller chain capacity drops off rapidly, HV chain powers continue to increase peaking at chain speeds over 30m/s.

HV capacity is ideal for all power transmission requirements involving high speed prime movers such as diesel engines or gas turbines.

Morse HV is the best buy for high capacity, high speed mechanical power transmission.

Silent Chain

'SC' series silent chains are available from $\frac{3}{16}$ " to 2" pitch in a selection of standard width sizes. All chains conform to ANSI B 29.2 and B 29.9 Standard ensuring total interchangeability.

For all chains except $\frac{3}{16}$ " pitch SC chain uses the special HV series pin an rocker joint providing optimum pitch compensation and reduced friction, enabling higher loads and speeds to be accommodated and compared to competitive chains.

For $\frac{3}{16}$ " pitch chain a round pin design is used to assist in manufacture, and increase flexibility for lower power drives. The round pin design is also used for double sided chains $\frac{1}{2}$ " and $\frac{3}{4}$ " pitch to enable full backbending.

Cross+Morse Roller Chain Drives



Cross+Morse manufacture and stock a comprehensive range of Precision Roller Chain Drives, conforming to both British Standard (BS) and American Standard (ANSI) dimensions within ISO 606; in pitch sizes from 6mm to 3" in simplex and multistrand versions. The chains are capable of handling powers from fractional to over 1000 kW, with operating speeds up to 25 metres per second. Cross+Morse Chains feature higher fatigue resistance and endurance limits achieved by using the latest methods in manufacture.

• **Pin and Bush Uniformity**

The High Endurance Limits of Morse Chain starts with the pins. Fine tolerance on pin diameters ensures optimum fit in outer link plate with accurate control of clearance between pin and bushing for correct lubrication, and pitch control. Bushes are 'curl-formed' from special quality cold rolled steel strip, into a cylindrical shape of uniform wall thickness.

• **Solid High Strength Rollers**

Morse Chain Rollers have solid walls for maximum strength, manufactured by machining from tube or cold extrusion process. The extruded rollers combine correct material grain orientation with high compressive residual surface stress for maximum impact resistance.

• **Precision Link Plates**

Link Plates are precision blanked from special through hardening steels with metallurgical composition selected to provide optimum tensile strength and fatigue resistance. Pin apertures are pierced and shaved to provide fine tolerance parallel bore holes, with accurate pitch control.

• **Heat Treatment**

Pins, bushes and rollers are case carburised and hardened under carefully controlled conditions to ensure correct balance between an extremely hard surface for wear resistance and a tough core for high impact strength. Link plates are subject to carbon restoration during hardening and tempering ensuring uniform optimum hardness and high tensile strength. Constant manual and electronic monitoring of Automatic Heat Treatment Plant ensures a uniform high quality product.

• **Chemical Blacking**

Roller Link Components are chemically blacked to improve corrosion resistance and adhesion of lubricants. Cross+Morse Chain can be instantly recognised by the resulting black and silver appearance

• **Easy De-Rivetting**

In order to enable the Customer to make their own chain lengths easy disassembly is built into Morse Chain through close tolerances on pins, link plates and rivet heads.

• **Assembly and Pre-Stress**

Heavy Press Fit of both pins and bushes into the side-plates creates a state of residual compressive stress around the apertures to further counteract service fatigue. The final manufacturing process is pre-stressing of the assembled chain. In this operation every pitch of chain is given one load cycle approaching the chains yield strength. Any parts in the assembly which, through manufacturing tolerance, are obliged to carry a greater share of the chain load, are caused to yield in their point of high stress. Pre-stressing the chain causes all components to equally share the work load so increasing resistance to fatigue.

• **Petrolatum Dipping**

All Morse Chains are dipped in anti-corrosive lubricant before packaging to afford the best available combination of pre-lubrication and rust protection. Applied hot, the petrolatum, with its superior corrosion-protecting qualities, penetrates every fine clearance of the chain assembly. Pre-lubrication with petrolatum gives the chain an excellent start in life, whether it receives periodic manual lubrication or is in an enclosed case with pump lubrication. The petrolatum will be dissolved through normal lubrication methods so it is not necessary to remove it from the chain on installation.

• **Quality Control**

Constant care and strict quality controls are exercised during raw material selection. Chemical analysis, metallurgical testing and product specifications are controlled through rigidly enforced quality control programmes throughout manufacturing and assembly. Assembled chain is subject to both mechanical and visual inspection to ensure it meets the required specifications. The high standards that are maintained are your assurance of a precision engineered product every time you specify Cross+Morse.

• **Appearance**

The quality of Morse Roller Chain is reflected in its fine appearance though careful attention to finishing by:- Deburring and polishing by barrelling all parts. The combination of polished outer link plates with chemically blacked roller units gives Cross+Morse Chains an attractive, distinctive appearance. Attractive strong package design providing protection against contamination and damage to finished chain during transportation and storage, ensure chain is in optimum condition when installed.

• **Precision Chain Sprockets**

To complete the Chain Drive a comprehensive range of Standard Pinions, Wheels and Platewheels stocked for B.S. Standard Chains up to 2" pitch are offered, and Sprockets for ANSI Chains and other special chains can be manufactured to customers specifications. Pinions and platewheels are normally manufactured from medium carbon steels for high strength, and can be induction hardened for additional wear resistance. Pinions and wheels for precision roller chain and inverted tooth chains have fully machined teeth to ensure accuracy of engagement with mating chains. Standard Sprocket Range includes taper bore sprockets and bushes for quick assembly, low price finished bore product with high torque capability; idler sprockets and chain tensioners.

• **Specialist Design**

An experienced staff of product specialists is available at the offices of Cross+Morse to assist Customers and Distributors in solving all their power transmission problems. Call your local representative and let him assume full responsibility for your Industrial Power Transmission requirements by specifying Cross+Morse.

By using modern chain manufacturing technology, combined with long established and proven specifications, Cross+Morse produce high performance Roller Chains of consistent quality.

Roller Chain Drive Design



Roller Chain by nature of its design is capable of transmitting high torque loads, and provides the ideal drive media for the connection of slow to medium speed shafts located on extended centres.

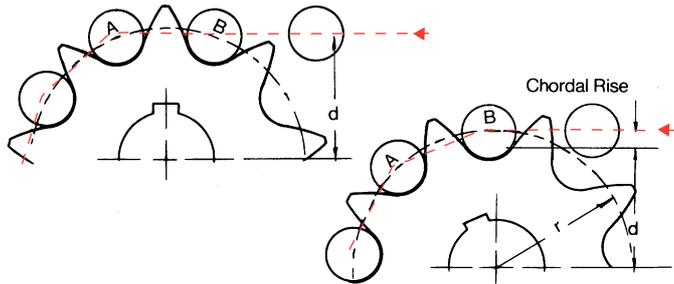
The selection and application is reasonably simple by following normal engineering practices, but there are points of good design practice specific to Roller Chain Drives, and consideration of these will ensure successful drive design.

• Numbers of Teeth in Sprockets

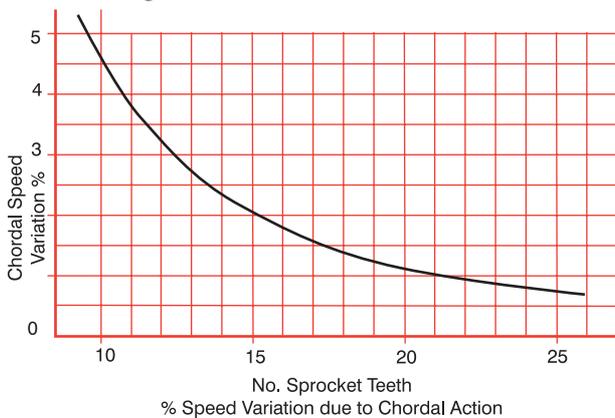
Chordal Action:- As a chain engages and disengages with a sprocket there is a rise and fall of each link, and a velocity variation. These are due to chordal action caused by the chain forming a polygon on the sprocket. In the diagrams below as Roller B approaches the sprocket it follows the chordal line of Roller A. Once engaged it is caused to rise following the arc of the pitch circle. As the chain unwraps from the sprocket the reverse occurs. As well as inducing a vibration into the chain, the linear velocity of the chain is varied from a minimum on effective radius d to a maximum on the pitch circle radius r . The level of this cyclic speed variation can be determined:-

$$\text{Chordal velocity variation} = 100 \left[1 - \cos \frac{180}{Z} \right] \%$$

where Z = number of teeth in sprocket.



Chordal action is unavoidable, but its magnitude and effect can be minimised by using sprockets with high numbers of teeth, the value becoming insignificant on drives with 25 tooth sprockets or larger.



Odd Numbers of Teeth:- As most drives have a chain with an even number of pitches, using an odd number teeth in the sprockets will assist uniform wear distribution for both chain and sprocket. An exception to this is for 1:1 ratio drives where even tooth sprockets are preferred to minimise the effects of chordal action on the drive.

Number of Teeth in Large Sprocket:- It is recommended that chainwheels should have a maximum of 114 teeth. This limitation is due to mis-matching of worn chain with large sprockets which increases with the number of teeth in the sprocket. A simple formula to indicate percentage of chain wear a sprocket can accommodate is:-

$$\frac{200\%}{Z}$$

It is normally considered good practice to replace chain if wear elongation exceeds 2%.

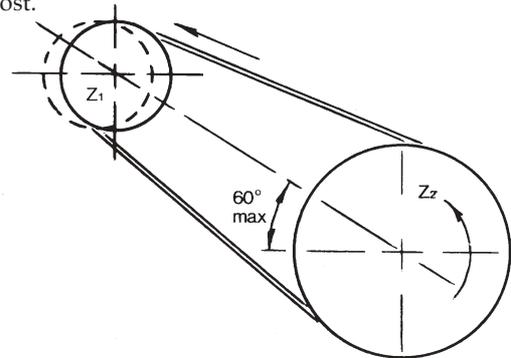
It is considered good practice that the sum of teeth on drives and driven sprocket should not be less than 50.

• Drive Ratio

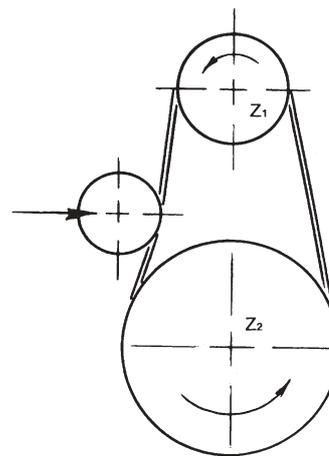
Roller Chain operates at high efficiency on drives with reduction ratios up to 3:1, but can be used effectively for drives up to 5:1 reduction. Higher ratios are not recommended but on some very slow speed drives reductions up to 10:1 have been used. High drive ratios require sprockets with large number of teeth, which restrict maximum chain wear with a resultant reduction in chain life. For reduction ratios above 5:1 consideration should be given to two-stage drive with idler shaft.

• Drive Arrangements

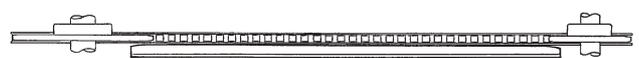
It is preferred to use Roller Chain on drives with horizontal shafting, although vertical shaft drives can be accommodated. Shaft centres may be displaced horizontal at an incline, or vertical, with each arrangement having its own specific requirement. Horizontally displaced shafts, and drives with centres inclination up to 60° , are the best and most common arrangements. On inclined drives the driver can be either above (as illustrated) or below the driven sprocket, but it is preferable to have the driving strand (tight side) of the chain uppermost.



For vertically displaced shaft drives, including drives with an inclination of over 60° to the horizontal, additional maintenance is required to ensure chain is always correctly adjusted, and for this reason automatic means of chain adjustment is recommended for these arrangements. It is always preferred to have the driver sprocket above the driven sprocket, as chain wear creates reduced contact on the lower sprocket.



Roller Chain is not recommended for drives with vertical shafts, but providing the drive is well engineered, and certain basic rules followed, a satisfactory drive can be achieved. As the chain is supported by its side-plates on the sprockets, it is essential to use sprockets with high numbers of teeth (minimum 25 teeth) to spread the load. To minimise catenary side loads on the chain shaft centres should be kept to a minimum (30 pitches max), and multi-strand chains used where possible. For slow speed drives (up to 1 M/S) special chain guides are available to support simplex chain for longer centre drives. It is imperative that chains are maintained in correct tension at all times, if acceptable life is to be achieved, and to minimise the effects of wear, chain selection should be made with an additional design factor of 2.



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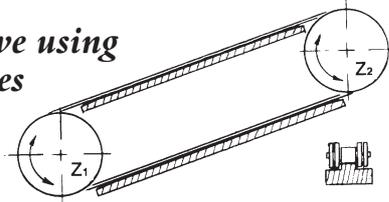
Roller Chain Drive Design



• Shafts Centre Distance

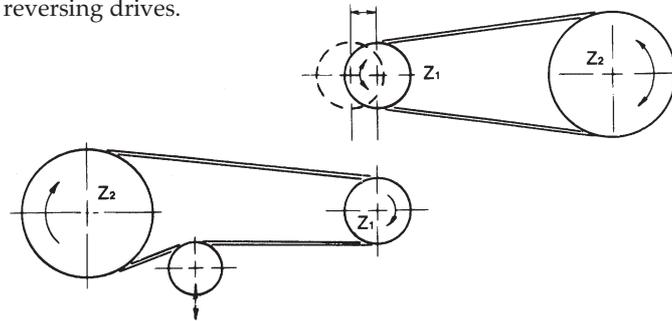
For optimum chain life shaft centres within the range 30 to 50 times chain pitch should be used, refer to page 9. Drives with centres up to 80 times pitch will perform satisfactorily providing adequate adjustment of chain tension is available. For very long centres, consideration should be given using two stage drive with idler, or alternatively for lightly loaded, slow speed (up to 1 m/s) drives, supporting both strands of chain on chain guides.

Long Centre Drive using Supporting Guides

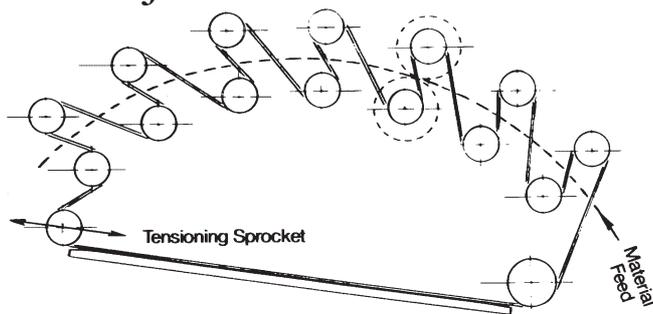


• Centre Distance Adjustment

When designing a chain drive ability to adjust the position of one shaft to compensate for chain wear, should be included, ideally equal to a minimum of 2 pitches of chain. If this is not possible, correction for chainwear can be achieved by the incorporation of adjustable idler or sprung loaded tensioner on the slack strand of the chain. Automatic adjustment for chain wear is recommended for drives with an inclination of more than 60° to the horizontal, see sketch. Idler or tensioner sprockets should be applied to the outside of the unloaded strand of the chain close to the driven sprocket, but allowing at least 5 pitches free length of chain between idler and sprocket at all times. Ideally at least 3 pitches of chain should engage with idler sprockets. Automatic tensioners cannot be used on reversing drives, or applications where high torque reversals could be encountered. Idlers also are not generally suitable for reversing drives.



Multi-shaft Drives

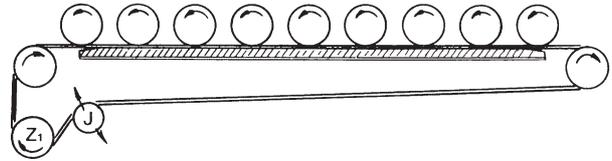


Typical Serpentine Drive

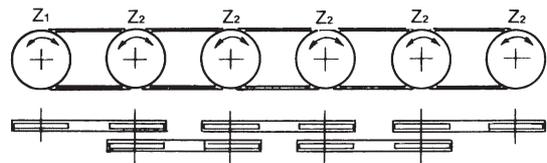
Drive to 7 pairs rollers in film process m/c

Roller Chain is often used to connect a number of shafts within one drive. Three arrangements are most common. Serpentine drives have the chain laced through a number of sprockets, so that some can be driven contra-rotation to the others.

These drives suffer high rates of wear due to the number of sprockets involved, and combined with necessary long chain length require inclusion of an idler with a lot of adjustment, within the drive. Sometimes a number of adjustable idlers are used.



Light live roller conveyor drives can be powered using a single loop of chain with sprockets running on top. The chain should be supported on plastic chain guide to maintain constant contact with sprockets, alternatively where rollers are well spaced idler sprockets can be positioned opposite between each pair of sprockets, this increasing the angle of contact on the driven sprockets. The small contact between driven sprocket and chain requires that torque on any one roller should never exceed 15% of rated power for the drive. Chain speed should never exceed 1 m/s. An advantage of this layout is that the driven sprockets and shafts can be easily removed.



Powered live roller conveyors usually have the rollers connected by coupled simple drives, often with the use of double simple sprockets. To keep chain loads to a minimum it is preferable to connect input drive to centre roller, this keeping wear to a minimum. A simple chain drive operates with an efficiency of 98%, therefore an allowance of 2% should be made for power loss in each loop of chain in determining chain selection and drive motor requirements.

• Elevated Temperature and Stainless Steel Chains

Standard Roller Chain loses some of its performance capability at elevated temperatures, and also is more prone to corrosion problems. Hardness of pins and bushes become reduced affecting operating life. At temperatures over 170°C chain drive capacity is reduced, and this must be included in drive selection by applying the factor f_3 from the table below. Standard Chain should not be used in temperatures over 250°C. For elevated temperature applications it is preferable to select Stainless Steel Chains, with standard series suitable on applications to 325°C, and 300 series chain for temperatures to 500°C. Stainless Steel Chain has lower wear resistance at all temperature, and therefore factor f_3 in table below should be applied when making chain selection.

Factor f_3 (Stainless and Elevated Temperature)

Temperature	Standard Roller Chain	Stainless Roller Chain	300 Series Stainless
-5 to 170°C	1.0	2.0	2.6
170 to 200°C	1.35	2.3	2.75
200 to 250°C	2.0	2.6	2.9
250 to 325°C	-	2.75	3.2
325 to 425°C	-	-	4.0
425 to 500°C	-	-	5.0

Useful formulae: The following formulae can be used in the Design and Selection of Chain Belt Drives.

$$\text{Power (kW)} = \frac{\text{Torque Nm} \times \text{rev/min}}{9550}$$

$$\text{Belt/Chain Speed (M/sec)} = \frac{Z \times p \times \text{r.p.m.}}{60,000}$$

Z = No. Teeth in Sprocket or Pulley
p = Belt/Chain pitch mm

Further design formulae and conversion tables are provided in the catalogue appendix.

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Roller Chain Drive Selection



Selection Procedure for Chain Drives with Two Sprockets

This selection procedure and the chain ratings will provide for a life expectancy of 15,000 hours for drives which incorporate a method of adjustment for wear, are operating in a clean environment at normal ambient temperatures, and subject to proper maintenance and adequate lubrication at all times. In order to use the selection procedure it is first necessary to assemble all data relevant to the application, which should include:-

- Power to be transmitted.
- Input shaft speed, and output speed required or drive ratio.
- Type of driver and driven equipment.
- Centres and layout of shafts.
- Shaft diameters.
- Environmental conditions.

Selection Procedure

The correct size of chain for an application can be made by reference to Selection Charts relating shaft speed and design power. The design power P_d is determined from the motor power P and application factors, f_1 , f_2 and f_3 if applicable.

$$P_d = P f_1 f_2 (f_3)$$

Where f_1 = Service Factor
 f_2 = Sprocket Size Factor
 f_3 = Temperature Factor
 also stainless steel chains refer to Page 6.

1. Service Factor - f_1

The service factor f_1 can be determined from details of the driver and driven equipment by selection from the table below. The service factor is applied to take into consideration the source of power, nature of the load, load inertia strain or shock, and the average hours per day of service. Normal duty drives are those with relatively little shock or load variation. Examples of typical drivers and driven equipment, are given at the bottom of the page.

Application factor f_1 - Service Factor

Characteristics of Driven Machine	Characteristics of Driver		
	Smooth Running	Slight Shock	Moderate Shock
Smooth Running	1.0	1.1	1.3
Moderate Shock	1.4	1.5	1.7
Heavy Shock	1.8	1.9	2.1

2. Sprocket Sizes - f_2

The sprocket sizes are determined by the drive ratio required.

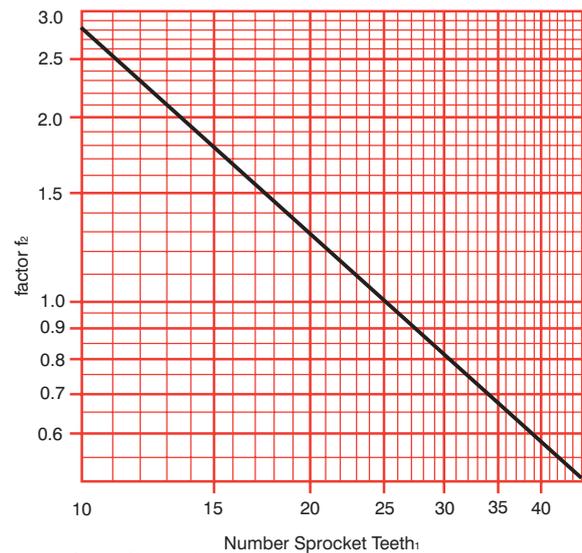
$$\text{Drive Ratio } i = \frac{\text{R.P.M. High Speed Shaft } n_1}{\text{R.P.M. Low Speed Shaft } n_2}$$

$$= \frac{\text{No. Teeth Large Sprocket } Z_2}{\text{No. Teeth Small Sprocket } Z_1}$$

Suitable sprockets can be selected from Ratio Table Page 8 with consideration given to the following.

Unless shaft speeds are very low it is advisable to use a minimum of 17 tooth sprockets. If the drive operates at high speeds or is subject to impulse load sprockets should have at least 25 teeth and should be hardened.

For low ratio drives, sprockets with high numbers of teeth minimise joint articulation, and bearing loads, thus extending chain life. On drives where ratios exceed 5:1 the designer should consider using compound drives for maximum service life. Having selected the number of teeth of the sprockets factor f_2 can be determined from the table below.



Example of Drivers

Smooth Running	Electric Motors Steam and Gas Turbines Internal Combustion Engines with Hydraulic Coupling
Slight Shock	Internal Combustion Engines with 6 Cylinders or more with Mechanical Coupling
Moderate Shock	Internal Combustion Engines with less than 6 Cylinders with Mechanical Coupling

Examples of Driven Machines

The following list classifies common driven mechanisms into their various duty ratings, given as a guide to assist in the final determination of the actual operating characteristics

Bakery Machinery.....	Moderate Shock
Brick and Clay Machinery.....	Heavy Shock
Centrifuges.....	Heavy Shock
Compressors:	
Centrifugal and Rotary.....	Smooth
Reciprocating.....	Heavy Shock
Conveyors:	
Apron, Bucket, Elevator, Pan.....	Heavy Shock
Belt (Uniformly Loaded).....	Smooth
Flight, Screw.....	Heavy Shock
Cotton Oil Plants.....	Heavy Shock
Cranes.....	Moderate to Heavy Shock
Crushing Machinery.....	Heavy Shock
Fans and Blowers:	
Centrifugal or Induced Draft.....	Moderate Shock
Mine Fans, Positive Blowers.....	Heavy Shock
Propellers.....	Heavy Shock

Flour, Feed or Cereal Mill Machinery:	
Separators, Sifters, Purifiers.....	Smooth
Roller Mills, Grinders.....	Moderate Shock
Generators and Exciters.....	Moderate Shock
Laundry Machinery.....	Moderate Shock
Liquid Agitators, Paddles or Propeller.....	Smooth
Mills.....	Heavy Shock
Paper Machinery:	
Agitators, Calendars, Dryers, Jordan Engines.....	Moderate Shock
Beaters, Chippers, Nash Pumps, Washers, Winder Drums, Yankee Dryers.....	Heavy Shock
Printing Machinery.....	Smooth
Pumps:	
Centrifugal, Gear, Rotary.....	Moderate Shock
Dredge, Duplex, Triplex.....	Heavy Shock
Rubber Plant Machinery.....	Heavy Shock
Textile Machinery.....	Smooth

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Roller Chain Drive Selection



3. Chain Size Selection

Having determined values for factors f_1 , f_2 and f_3 (if applicable), the design Power can be determined.

$$P_d = P \cdot f_1 \cdot f_2 \cdot f_3$$

By relating the design Power P_d with the rotational speed of the small sprocket n_1 on the Capacity Chart pp10/11 the correct size of chain for the application can be selected.

Use the Capacity Charts to select the smallest pitch of simplex chain which will transmit the design Power, as this normally provides the most economic selection. However, other factors should also be considered when making this selection.

a. The preferred centre distance ranges between 30 and 50 times the chain pitch, and there should always be a minimum arc of contact of the chain on the small sprocket of 120° ; or for sprockets with low numbers of teeth a minimum of 5 teeth in contact. The following are preferred centre distances against chain pitch.

Chain Pitch	8mm	3/4"	1/2"	5/8"	3/4"	1"
Min. Centres	240	280	380	470	570	760
Max. Centres	400	480	640	800	960	1270

Chain Pitch	1 1/4"	1 1/2"	1 3/4"	2"	2 1/2"	3"
Min. Centres	950	1140	1320	1500	1900	2275
Max. Centres	1590	1920	2250	2550	3200	3850

There will always be a minimum arc of contact of 120° if the centre distance in pitches is greater than $0.32x$ the difference in numbers of teeth of driven and driver sprocket.

b. When a compact drive is required, then a multiplex chain of a smaller pitch should be used with resultant reduction in chain wheel diameters.

The Capacity Charts are based on drives of uniform operation without over loads, shocks or frequent starts, using a 25 tooth pinion, and can be used to select drives with corrected design Power where:-

- The chain drive consists of two chain wheels mounted on parallel, horizontal shafts.
- The drive has a maximum speed reduction of 3:1.
- The operating temperature is within the range -5°C to 70°C .
- The chainwheels are correctly aligned and the chain maintained in correct adjustment at all times. Refer to page 13.
- An adequate supply of clean lubricant is maintained.
- The chain is of riveted construction without any crank links.
- The chain has a length of 120 pitches. A shorter chain length will still be suitable to transmit the powers indicated, but the wear life will be proportionally reduced. Chains of longer length give little improvement in overall life, and chains over 150 pitches should only be used when shaft speeds are low.

4. Check Drive Selection

Check with sprocket dimensions pp 27/55 to ensure sprocket will accommodate shaft sizes. If shaft diameters exceed maximum bore of selected sprockets it will be necessary to increase numbers of teeth in sprockets or select larger pitch chain.

Check that sprocket diameters and chain clearance requirements can be accommodated within the space envelope. If dimensions are restricted select multi-strand chains of smaller pitch.

5. Determine Chain Length and Actual Centre Distance

Refer to page 9 for calculations of chain length. Note that for all drives the shaft centres should be at least 2mm greater than half the sum of the sprocket outside diameters; and for drives with ratio greater than 3:1 centres should be minimum of the summation of the sprocket pitch circle diameters

Ratios possible with Stock Sizes

		Number of Teeth - Driver Sprocket																						
		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	30			
Number of Teeth - Driven Sprocket	11	1.22	1.10	1.00																				
	12	1.33	1.20	1.09	1.00																			
	13	1.44	1.30	1.18	1.08	1.00																		
	14	1.56	1.40	1.27	1.17	1.08	1.00																	
	15	1.67	1.50	1.36	1.25	1.15	1.07	1.00																
	16	1.78	1.60	1.45	1.33	1.23	1.14	1.07	1.00															
	17	1.89	1.70	1.55	1.42	1.31	1.21	1.13	1.06	1.00														
	18	2.00	1.80	1.64	1.50	1.38	1.29	1.20	1.13	1.06	1.00													
	19	2.11	1.90	1.73	1.58	1.46	1.36	1.27	1.19	1.12	1.06	1.00												
	20	2.22	2.00	1.82	1.67	1.54	1.43	1.33	1.25	1.18	1.11	1.05	1.00											
	21	2.33	2.10	1.91	1.75	1.61	1.50	1.40	1.31	1.23	1.17	1.10	1.05	1.00										
	22	2.44	2.20	2.00	1.83	1.69	1.57	1.47	1.38	1.29	1.22	1.16	1.10	1.05	1.00									
	23	2.56	2.30	2.09	1.92	1.77	1.64	1.53	1.44	1.35	1.28	1.21	1.15	1.10	1.05	1.00								
	24	2.67	2.40	2.18	2.00	1.85	1.71	1.60	1.50	1.41	1.33	1.26	1.20	1.14	1.09	1.04	1.00							
	25	2.78	2.50	2.27	2.08	1.92	1.79	1.67	1.56	1.47	1.39	1.32	1.25	1.19	1.14	1.09	1.04	1.00						
	26	2.89	2.60	2.36	2.17	2.00	1.86	1.73	1.63	1.53	1.44	1.37	1.30	1.24	1.18	1.13	1.08	1.04	1.00					
	27	3.00	2.70	2.45	2.25	2.08	1.93	1.80	1.69	1.59	1.50	1.42	1.35	1.29	1.23	1.17	1.12	1.08	1.04	1.00				
	28	3.11	2.80	2.54	2.33	2.15	2.00	1.87	1.75	1.65	1.56	1.48	1.40	1.33	1.27	1.22	1.16	1.12	1.08	1.04	1.00			
	29	3.22	2.90	2.64	2.42	2.23	2.07	1.93	1.81	1.71	1.61	1.53	1.45	1.38	1.32	1.26	1.21	1.16	1.12	1.07				
30	3.33	3.00	2.73	2.50	2.31	2.14	2.00	1.88	1.76	1.67	1.58	1.50	1.43	1.36	1.30	1.25	1.20	1.15	1.11	1.07				
32	3.56	3.20	2.91	2.67	2.46	2.28	2.13	2.00	1.88	1.78	1.68	1.60	1.52	1.45	1.39	1.33	1.28	1.23	1.19	1.15	1.11	1.07		
35	3.89	3.50	3.18	2.92	2.69	2.50	2.33	2.19	2.06	1.94	1.84	1.75	1.67	1.59	1.52	1.46	1.40	1.34	1.30	1.25	1.21	1.17	1.13	
38	4.22	3.80	3.45	3.17	2.92	2.71	2.53	2.38	2.24	2.11	2.00	1.90	1.81	1.73	1.65	1.58	1.52	1.46	1.41	1.36	1.32	1.27	1.23	
40	4.44	4.00	3.64	3.33	3.08	2.86	2.67	2.50	2.35	2.22	2.10	2.00	1.90	1.82	1.74	1.67	1.60	1.54	1.48	1.43	1.38	1.34	1.29	
45	5.00	4.50	4.09	3.75	3.46	3.21	3.00	2.81	2.65	2.50	2.37	2.25	2.14	2.04	1.96	1.88	1.80	1.73	1.67	1.61	1.56	1.51	1.46	
57	6.33	5.70	5.18	4.75	4.38	4.07	3.80	3.56	3.35	3.17	3.00	2.85	2.71	2.59	2.48	2.37	2.28	2.19	2.11	2.03	1.96	1.89	1.82	
76	8.44	7.60	6.91	6.33	5.85	5.43	5.07	4.75	4.47	4.22	4.00	3.80	3.62	3.45	3.30	3.17	3.04	2.92	2.81	2.71	2.61	2.51	2.41	
95		9.50	8.64	7.92	7.31	6.79	6.33	5.94	5.59	5.28	5.00	4.75	4.52	4.32	4.13	3.96	3.80	3.65	3.52	3.39	3.28	3.17	3.06	
114				9.50	8.77	8.14	7.60	7.12	6.71	6.33	6.00	5.70	5.43	5.18	4.96	4.75	4.56	4.38	4.22	4.07	3.93	3.79	3.65	

Chain Length and Centre Distance Calculations



For chain drives incorporating two sprockets, and given an approximate shaft centre distance, the following procedures can be used to determine chain length and actual centre distance.

A. Determining number of pitches in chain.

1. For drives where sprockets have same number of teeth.

$$\text{Chain Length Pitches } L_C = \frac{2 A_o + z}{p}$$

2. For drives where sprockets have different number of teeth.

- Divide the centre distance A_o mm by pitch chain p mm to obtain.....C
- Add teeth in the small sprocket Z_1 to the teeth in the larger sprocket Z_2 to obtain.....S
- Subtract the teeth in the small sprocket Z_1 from the teeth in the large sprocket Z_2 to obtain value.....D
From the table below obtain corresponding value.....K
- Chain lengths in pitches $L_c = 2C + \frac{S}{2} + \frac{K}{C}$

3. The calculated chain length L_c will need to be rounded to the nearest whole number of pitches, with preference to even numbers to avoid the use of crank link connectors. Where tensioners are to be used in the drive the calculated chain length should also be increased to obtain actual length L_A . To convert to length in feet or metres, use conversion table below.

4. To obtain actual centre distance, A, having decided on the actual chain length, L_A pitches, the following formula can be used.

$$A = p \left[\frac{L_A - S/2 + \sqrt{[L_A - S/2]^2 - 8K}}{4} \right]$$

This provides a reasonably accurate result, but for fixed centre drives some correction will be required, and for these you are advised to use conversion tables or consult Cross+Morse Technical Department.

Where:-

- A = Actual Centre Distance (mm)
- A_o = Approx. Shaft Centres (mm)
- L_c = Calculated Chain Length Pitches
- L_A = Actual Number of Pitches
- p = Chain Pitch (mm)
- Z_1 = Number of Teeth in Small Sprocket
- Z_2 = Number of Teeth in Large Sprocket

Example:

Given: $Z_1 = 25$, $Z_2 = 60$, $p = \frac{1}{2}$ inch = 12.7mm.
Approx. Centre Distance $A_o = 610$ mm.

Determine:

- Chain length L_c to nearest even number of pitches.
- Centre distance based on actual number of pitches L_A .

Solution:

- $C = 610 \div 12.7 = 48.03$
- $S = 25 + 60 = 85$
- $D = 60 - 25 = 35$, corresponding $K = 31.03$
- $L_c = \frac{(2 \times 48.03) + 85 + 31.03}{2 \times 48.03} = 139.21$ pitches
- $L_A = 140$ pitches (nearest even number).
- Actual Centre Distance A

$$= 12.7 \left[\frac{140 - 85/2 + \sqrt{[140 - 85/2]^2 - 8 \times 31.03}}{4} \right]$$

$$= 615.056\text{mm.}$$

$\frac{1}{2}$ inch Pitch Chain operating in 60 and 25 Tooth Sprockets will require 140 pitches of chain for a nominal Centre Distance of 615.05mm.

D	K	D	K	D	K	D	K	D	K	D	K
1	.03	26	17.12	51	65.88	76	146.31	101	258.39	126	402.14
2	.10	27	18.47	52	68.49	77	150.18	102	263.54	127	408.55
3	.23	28	19.86	53	71.15	78	154.11	103	268.73	128	415.01
4	.41	29	21.30	54	73.86	79	158.09	104	273.97	129	421.52
5	.63	30	22.80	55	76.62	80	162.11	105	279.27	130	428.08
6	.91	31	24.34	56	79.44	81	166.19	106	284.67	131	434.69
7	1.24	32	25.94	57	82.30	82	170.32	107	290.01	132	441.36
8	1.62	33	27.58	58	85.21	83	174.50	108	295.45	133	448.07
9	2.05	34	29.28	59	88.17	84	178.73	109	300.95	134	454.83
10	2.53	35	31.03	60	91.19	85	183.01	110	306.50	135	461.64
11	3.06	36	32.83	61	94.25	86	187.34	111	312.09	136	468.51
12	3.65	37	34.68	62	97.37	87	191.72	112	317.74	137	475.42
13	4.28	38	36.58	63	100.54	88	196.16	113	323.44	138	482.39
14	4.96	39	38.53	64	103.75	89	200.64	114	329.19	139	489.41
15	5.70	40	40.53	65	107.02	90	205.17	115	334.99	140	496.47
16	6.48	41	42.58	66	110.34	91	209.76	116	340.84	141	503.59
17	7.32	42	44.68	67	113.71	92	214.40	117	346.75	142	510.76
18	8.21	43	46.84	68	117.13	93	219.08	118	352.70	143	517.98
19	9.14	44	49.04	69	120.60	94	223.82	119	358.70	144	525.25
20	10.13	45	51.29	70	124.12	95	228.61	120	364.76	145	532.57
21	11.17	46	53.60	71	127.69	96	233.44	121	370.86	146	539.94
22	12.26	47	55.95	72	131.31	97	238.33	122	377.02	147	547.36
23	13.40	48	58.36	73	134.99	98	243.27	123	383.22	148	554.83
24	14.59	49	60.82	74	138.71	99	248.26	124	389.48	149	562.36
25	15.83	50	63.33	75	142.48	100	253.30	125	395.79	150	569.93

Chain Length Conversion Data

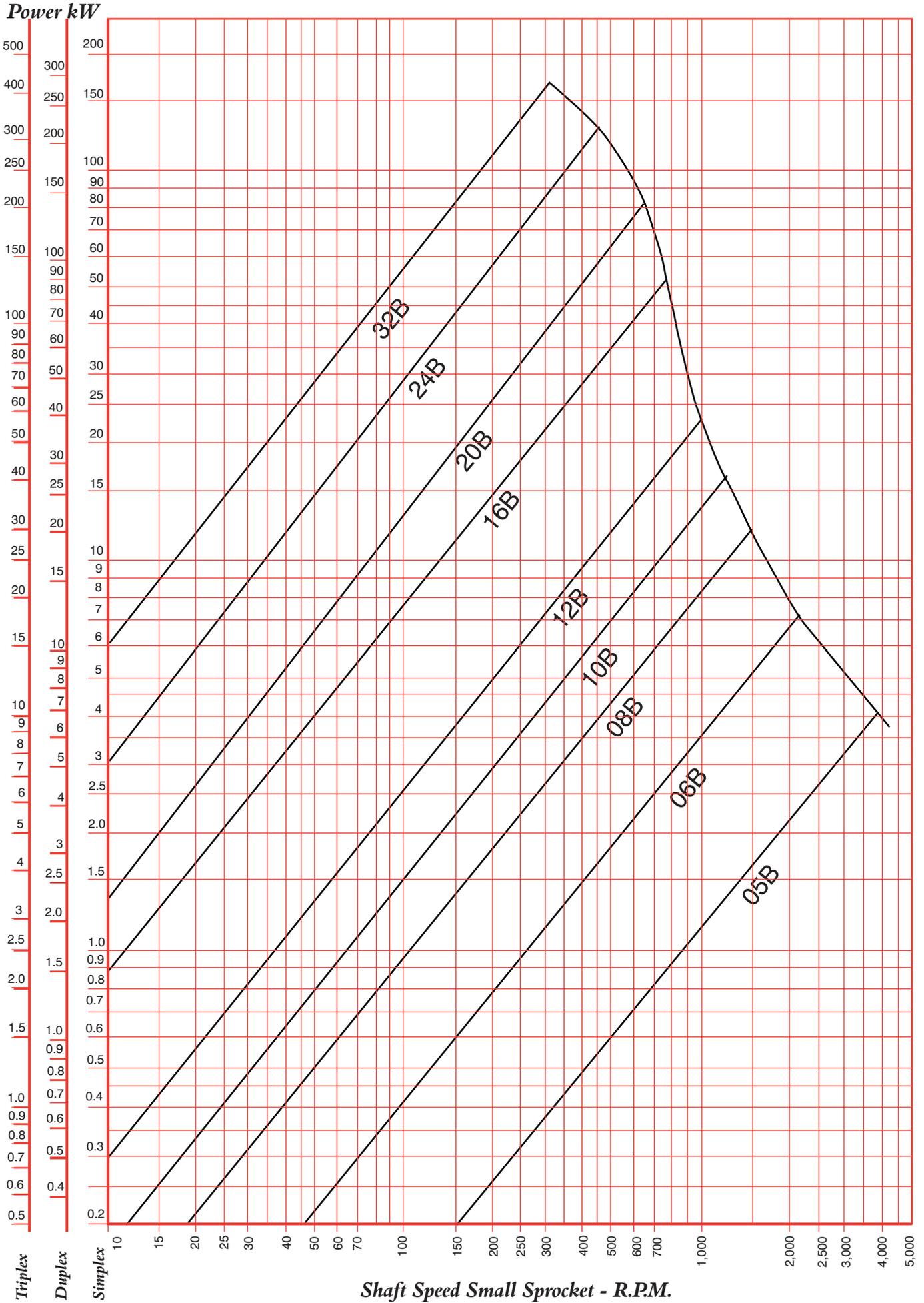
Chain Pitch (ins)	Pitches/ft	Pitches/Metre									
$\frac{1}{4}$ "	48	157.480	$\frac{5}{8}$ "	19.2	62.992	$1\frac{1}{4}$ "	9.6	31.496	2"	6.0	19.685
$\frac{3}{8}$ "	32	104.987	$\frac{3}{4}$ "	16	52.493	$1\frac{1}{2}$ "	8	26.247	$2\frac{1}{2}$ "	4.8	15.748
$\frac{1}{2}$ "	24	78.740	1"	12	39.370	$1\frac{3}{4}$ "	6.857	22.497	8mm	38.1	125.000

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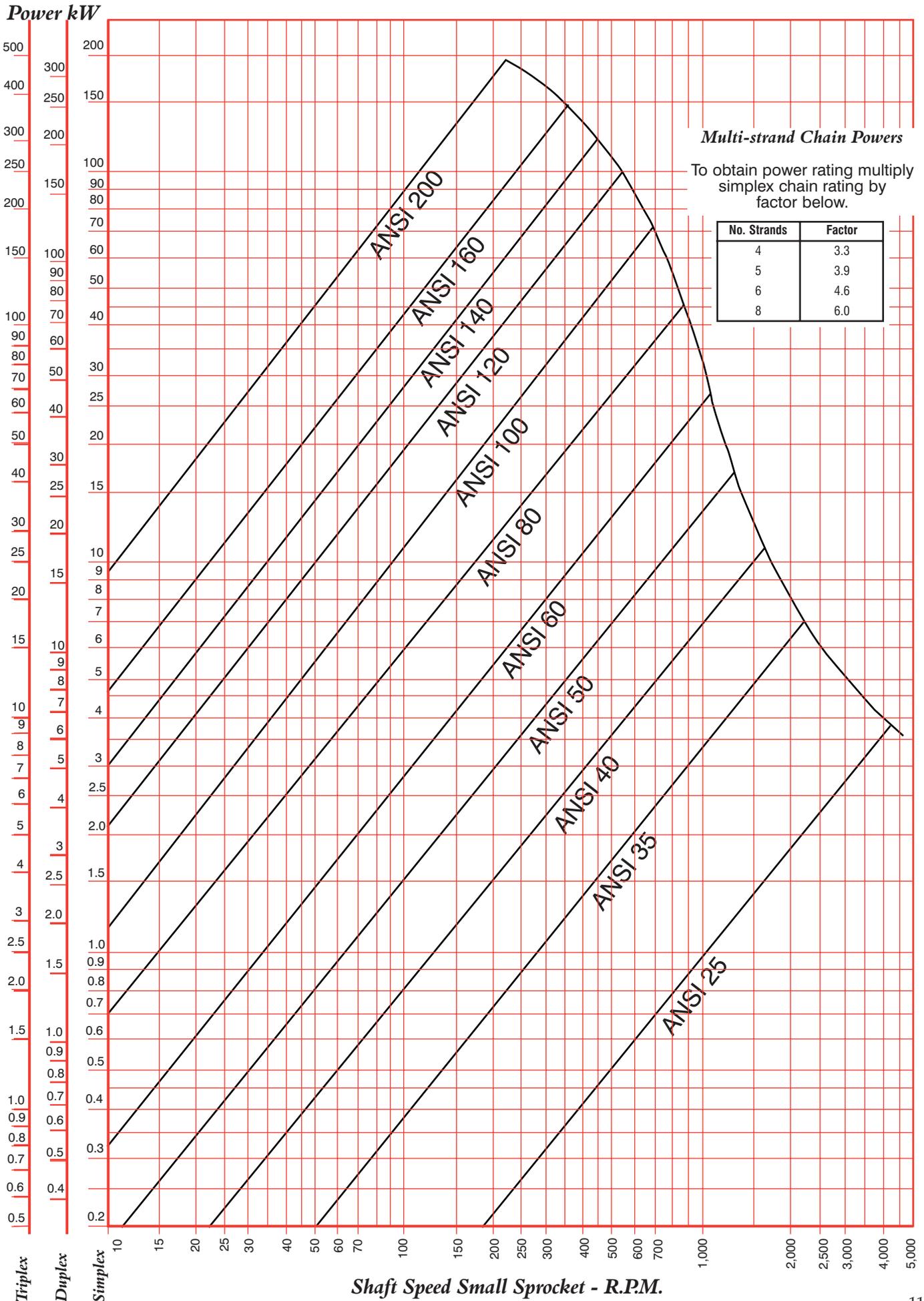
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Chain Drive Selection Power Rating Graph - British Standard Gears



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Chain Drive Selection Power Rating Graph - American Standard Chains



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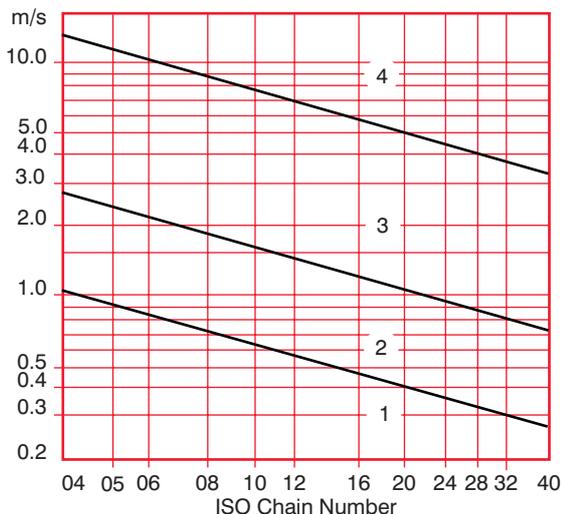
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Lubrication Systems

An adequate supply of lubrication is necessary to ensure a satisfactory wear life for any chain drive. Roller chain when supplied is coated in a heavy petroleum grease to provide protection until installation. For some slow, light load applications this lubrication is adequate providing a short wear life can be accepted, but for the majority of applications an oil lubrication system to provide further lubrication will be required, the type being dependant on chain size, loads and operating speed. When oil is applied to a roller chain a separating wedge of fluid is formed in the operating joints, similar to journal bearings, thereby minimising metal to metal contact. When applied in sufficient volume the oil also provides effective cooling and impact dampening at higher speeds. Chain life will vary appreciably depending on the lubrication system used, and therefore it is important that lubrication recommendations are complied with. The chain rating tables used for selection only apply for drives lubricated in line with the following recommendations. Chain drives should be encased for protection from dirt and moisture, and oil supplies should be kept free of contamination. A good quality, petroleum-based, non detergent thin oil should be used, and changed periodically (Max. 3000 hours operating life). Heavy oils and greases are not recommended for most applications, because they are too stiff to enter the small spaces between precision chain components. The following table indicates correct lubricant viscosity for various ambient temperatures.

Temperature °C	Oil Viscosity	Commercial Grade
-5 to +5	VG 68	SAE 20
5 to 25	VG 100	SAE 30
25 to 45	VG 150	SAE 40
45 to 70	VG 220	SAE 50

There are four basic types of lubrication for chain drives, the correct one being determined by chain size and speed. This provides for the minimum lubrication requirements, but the use of a higher type (i.e. type 3 instead of type 2) will normally be beneficial to chain life and performance. The correct type can be selected from graph below of chain speed against chain size. Refer to page 6 for chain speed calculation.



Type 1 - Manual Lubrication

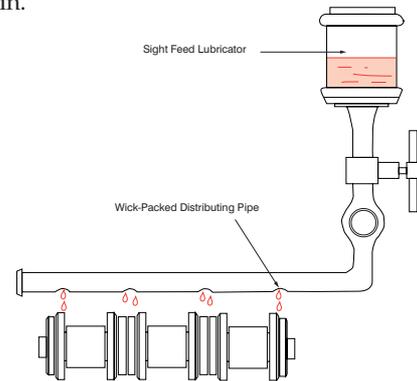
Oil is applied with a brush or oil-can at least once every 8 hours of operation. The volume and frequency of application should be sufficient to keep the chain wet with oil and prevent overheating or discolouration of lubricant in the chain joints. The use of aerosol-can lubricant is often satisfactory on slow speed drives. It is important that the lubricant used is of a type specified for roller chains, most of which include P.T.F.E. or other additive to reduce friction.

Caution - Manual types of lubrication must never be applied while drive is in operation.

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Type 2 - Drip Feed Lubrication

Oil drops are directed between the link plate edges from a drip lubricator. Volume and frequency should be sufficient to prevent discolouration of lubricant in the chain joints. Precaution must be taken against misdirection of the drops by wind from the passing chain.

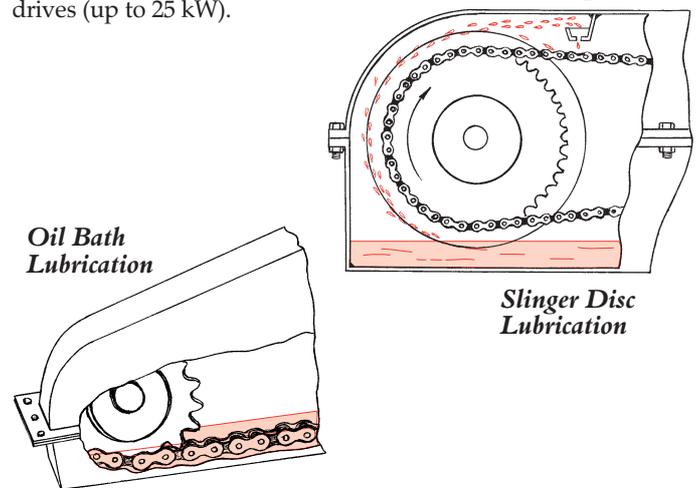


Type A - Drip Feed Lubrication

Type 3 - Oil Bath or Disc Lubrication

With oil bath lubrication the lower strand of the chain passes through a bath of oil in an enclosed chain case. The oil level must be carefully controlled to be between the pitch line and top of the chain at its lowest point. Adequate sump capacity is required to avoid overheating the oil, as a guide capacity in litres should at least equal half weight of chain Kg/m. This form of lubrication is most effective when the lower strand of chain is the slack strand.

With disc lubrication the chain operates above the oil level. A disc picks up oil and slings it against a collector plate from which it collects in a trough to drip onto the chain. The disc must be sized to produce rim speeds between 4 and 40 m/s. Generally disc slinger systems are only capable of delivering small quantities of oil and thus should be restricted to lower power drives (up to 25 kW).



Type 4 - Forced Feed Lubrication

Oil is pressure fed from a circulating pump, or central lubrication system, via a spray bar, onto the chain. The spray bar should have holes 3mm dia. positioned over the side plates of the chain (see sketch for drip feed), so as to direct the oil between the side plates. The spray bar should be located inside the chain loop close to the driven sprocket and approximately 5cm from the slack strand of the chain, with oil holes directed to deliver oil onto the chain as it enters the driven sprocket.

Oil flow rate should be a minimum of 3.5 litres/min per strand width of chain. Oil reservoir capacities should be a minimum of 3 times oil flow rate, and lubrication system should include a full flow oil filter.

For lubrication requirements outside the above recommendations consult Cross+Morse Engineering Department.

Chain Drive Installation and Maintenance

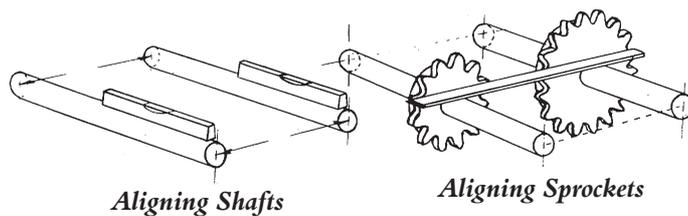


Alignment of Shafts and Sprockets

Although Roller Chain provides a flexible connection of shafts, careful and accurate installation is necessary for trouble free operation.

The shafts must be rigidly supported by suitable bearing assemblies, and must be accurately aligned. The use of a spirit level is recommended to ensure shafts are horizontally aligned. Measurement between shafts at their extremities will determine parallelism. On fixed centre designs, manufacturing tolerance should ensure total shaft misalignment can never exceed 0.1%. Sprockets should have tight fit on shafts, with close fit keys and set screws to ensure rigid mounting, and should be located close to the support bearing. Sprocket alignment can be checked by a straight edge on the tooth faces, or for longer centre drives a taut wire. Ideally sprockets should be in-line, but if not, misalignment must never exceed 4% pitch of chain or severe damage will be caused to the drive.

Accurate alignment of shafts and sprockets ensures uniform load distribution across chain width. Alignment should be checked periodically for maximum chain life. When replacement chain is installed check sprockets for abnormal wear which indicates misalignment.

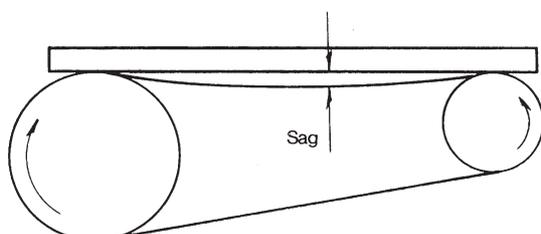


Chain Installation

If centre distance adjustment is available centres should be reduced to a minimum to assist with chain installation. Wrap chain around the two sprockets and bring the ends together around the larger sprocket in mesh with the teeth which will hold the links in correct position. The connecting link can then be inserted, care being taken to ensure that for duplex and triplex chains the centre link plates are fitted. Where spring clip connecting links are used the closed end of the spring clip must face the direction of rotation. For high speed drives or drives working in arduous conditions it is preferable to use a rivetting connecting link. This can be installed in the same manner, but the back of the link must be rigidly supported whilst the interference fit outer link is fitted and the pins rivetted over.

Chain Tension

To obtain the full life of a chain drive some means of chain length adjustment is necessary. The preferred method is by moving one of the shafts, but if this is not possible an adjustable or sprung loaded idler sprocket engaging with the outside of the slack strand of chain is recommended. Where manual adjustment is required this should be carried out regularly. The total slack in the chain can be determined by counter rotating the sprockets so one strand is taut, and then measuring the total sag between chain and a straight edge midway between the sprockets. For horizontal drives this sag should be 1 - 2% of the centre distance, for vertical drives it should be only 0.5 to 1%



Matched Chains

Combination of powers and speeds sometimes require the use of paired transmission chains operating on double multi-strand sprockets. For these transmission applications chains are built up from shorter sections which are accurately measured and graded for length. Chains from one grade are then used to form a matched pair of chains complete or in handling sections. Chains are suitably identified to ensure correct installation on site. Many light conveying applications use a pair of transmission chains with attachments. As these chains are often connected by the equipment the attachments carry, matching of the chains is required. There are two levels of matching available:
Simple pairing:- Determines that the length of two strands of chain are the same, this being suitable for short run conveyors.
Selective Pairing:- Involves the accurate measurement of handling lengths, usually 3m long which are then paired and identified for assembly into the total matched pair of chains.

Maintenance of Chain Drives

For slow speed drives employing manual lubrication of the chain, frequent access to the drive is made for relubrication. Whilst lubricating the chain visual inspection of both chain and sprockets for abnormal wear and damage should be made, also apparent levels of sag observed.

For higher speed drives employing automated methods of lubrication regular checks of oil levels will be required to ensure they never fall below minimum levels. The frequency of these checks will vary with operating conditions for each drive, and can only be determined by experience. With oil bath lubrication, it is important to check more frequently as bath lubrication is effective only within a narrow band of oil level.

It is good preventative maintenance to make routine external inspection of the machinery to ensure it is running smoothly, and recommended that detailed inspection to be made at least 3 times a year. After the first 500 hours of operation oil should be changed and a complete inspection made and centres adjusted if applicable. Oil should then be changed at least once a year or earlier if it is discoloured or contaminated. At oil changes, make a complete examination of chain, sprockets, shafts, bearings, seal and lubrication system, also check alignment and sag, and correct as necessary.

For efficient, reliable operation of chain drives it is recommended to replace the chains when elongation due to wear exceeds 2%. If maintenance records of centre distance adjustment are kept it can be determined when the chain will require replacing, as centres will also have increased by more than 2%. Otherwise it will be necessary to remove the chain from the drive and measure it over a whole number of pitches approx. 600mm length for chains below 1 inch pitch or, 1200mm for longer pitch chains, at a load of 1% of the catalogue tensile strength. Replace chain if length greater than:- $1.02Xp$ where X = number pitches measured. If a chain has not worn in excess of 2%, but there is insufficient adjustment available on the drive to correctly tension the chain, it can be shortened in length by the removal of a number of pitches. It is not good practice to introduce new components into a well worn chain, as this will cause uneven running with subsequent damage, and for this reason it is always preferred to reduce the chain length by an even number of pitches, unless an offset link was fitted from original installation. To reduce a normal chain assembly, incorporating a connecting link, by two pitches remove the first outer link away from the connecting link using the chain breakers illustrated on page 33.

Caution

Chain drives can be dangerous if not handled correctly. Whilst drives are in operation chain cases and guards should be secured in place to prevent any contact. Prior to removal of guards ensure that power source has been switched off and isolated.

When removing, replacing, or altering a chain always:-

1. Wear protective clothing appropriate including safety glasses, gloves and shoes.
2. Use correct tools, and ensure they are in good working order.
3. Support the chain and sprockets to avoid sudden movement.
4. Release all tensioning devices.
5. Ensure chain construction is fully understood.

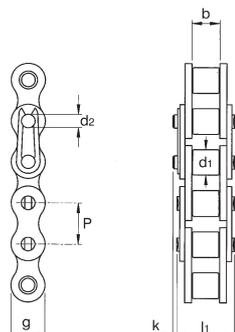
When chain is removed and inspected never re-use any damaged chain or component.

British Standard Precision Roller Chain

Conforming to ISO 606 and DIN 8187



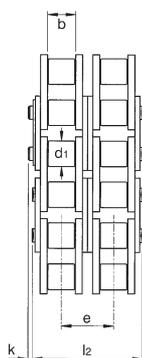
Simplex Roller Chains



Cat No.†	Pitch P	Inside Width b min mm	Roller Dia. d1 max. mm	Pin Dia. d2 max. mm	Plate Depth g mm	Pin Length l1 max. mm	Con Pin Ext. k mm	Transverse Pitch e mm	Bearing Area cm ²	Tensile Strength N	Approx Weight kg/m
04 B†	6mm	2.80	4.00	1.85	5.0	7.4	2.9		0.07	3,000	0.12
05 B-1	8mm	3.00	5.00	2.31	7.1	8.6	3.1		0.11	4,600	0.18
06 B-1	3/8 inch	5.72	6.35	3.28	8.3	12.8	2.2		0.28	9,100	0.41
08 B-1	1/2 inch	7.75	8.51	4.45	11.8	16.2	2.1		0.50	18,200	0.70
081-1	1/2 inch	3.30	7.75	3.66	9.9	10.2	1.5		0.21	8,200	0.28
083-1	1/2 inch	4.88	7.75	4.09	10.3	12.9	1.5		0.32	12,000	0.42
084-1	1/2 inch	4.88	7.75	4.09	11.1	14.8	1.5		0.35	16,000	0.59
08L †	1/2 inch	6.40	7.75	3.97	11.5	15.1	2.0		0.38	16,000	0.53
08N †	1/2 inch	4.88	7.75	3.66	9.9	10.9	2.8		0.28	8,200	0.33
086 †	1/2 inch	5.21	8.51	4.45	11.6	15.0	3.9		0.39	18,200	0.62
101 †	5/8 inch	6.48	10.16	5.08	15.0	16.0	3.5		0.51	22,700	0.80
10 B-1	5/8 inch	9.65	10.16	5.08	14.7	18.6	2.2		0.67	22,700	0.96
12 B-1	3/4 inch	11.68	12.07	5.72	16.1	21.9	2.6		0.89	29,000	1.23
16 B-1	1 inch	17.02	15.88	8.28	21.1	35.6	3.1		2.10	64,000	2.60
20 B-1	1 1/4 inch	19.56	19.05	10.19	26.3	41.0	3.1		2.95	98,000	3.70
24 B-1	1 1/2 inch	25.40	25.40	14.63	33.3	53.4	3.5		5.54	170,000	6.90
28 B-1	1 3/4 inch	30.99	27.94	15.90	37.0	65.8	3.6		7.40	200,000	8.60
32 B-1	2 inch	30.99	29.21	17.78	40.6	64.8	3.8		8.11	260,000	9.50

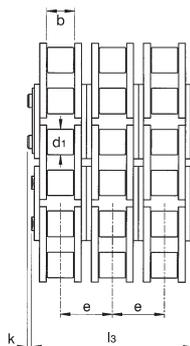
† Cat No. equates to ISO 606 Chain ref. except where indicated, which are chains to factory std.

Duplex Roller Chains



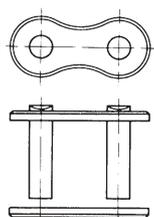
Cat No.†	Pitch P	Inside Width b min mm	Roller Dia. d1 max. mm	Pin Dia. d2 max. mm	Plate Depth g mm	Pin Length l1 max. mm	Con Pin Ext. k mm	Transverse Pitch e mm	Bearing Area cm ²	Tensile Strength N	Approx Weight kg/m
05 B-2	8mm	3.0	5.0	2.31	7.1	14.3	3.1	5.64	0.22	8,000	0.36
06 B-2	3/8 inch	5.72	6.35	3.28	8.3	22.9	2.2	10.24	0.55	17,300	0.78
08 B-2	1/2 inch	7.75	8.51	4.45	11.8	30.2	2.1	13.92	1.00	31,800	1.40
10 B-2	5/8 inch	9.65	10.16	5.08	14.7	35.4	2.2	16.59	1.34	45,400	1.80
12 B-2	3/4 inch	11.68	12.07	5.72	16.1	41.4	2.6	19.46	1.78	57,900	2.44
16 B-2	1 inch	17.02	15.88	8.28	21.1	67.6	3.1	31.88	4.21	122,000	5.30
20 B-2	1 1/4 inch	19.56	19.05	10.19	26.3	77.6	3.1	36.45	5.91	187,000	7.45
24 B-2	1 1/2 inch	25.40	25.40	14.63	33.2	101.5	3.5	48.36	11.09	324,000	13.75
28 B-2	1 3/4 inch	30.99	27.94	15.90	37.0	125.2	3.6	59.56	14.81	380,000	17.30
32 B-2	2 inch	30.99	29.21	17.78	40.6	123.0	3.8	58.55	16.23	495,000	18.80

Triplex Roller Chains



Cat No.†	Pitch P	Inside Width b min mm	Roller Dia. d1 max. mm	Pin Dia. d2 max. mm	Plate Depth g mm	Pin Length l1 max. mm	Con Pin Ext. k mm	Transverse Pitch e mm	Bearing Area cm ²	Tensile Strength N	Approx Weight kg/m
06 B-3	3/8 inch	5.72	6.35	3.28	8.3	32.8	2.2	10.24	0.83	25,400	1.18
08 B-3	1/2 inch	7.75	8.51	4.45	11.8	44.1	2.1	13.92	1.50	45,400	2.10
10 B-3	5/8 inch	9.65	10.16	5.08	14.7	51.9	2.2	16.59	2.02	68,100	2.85
12 B-3	3/4 inch	11.68	12.07	5.72	16.1	60.8	2.6	19.46	2.68	86,500	3.63
16 B-3	1 inch	17.02	15.88	8.28	21.1	99.4	3.1	31.88	6.32	182,000	7.80
20 B-3	1 1/4 inch	19.56	19.05	10.19	26.3	114.9	3.1	36.45	8.86	280,000	11.4
24 B-3	1 1/2 inch	25.40	25.40	14.63	33.2	149.5	3.5	48.36	16.64	485,000	20.5
28 B-3	1 3/4 inch	30.99	27.94	15.90	37.0	184.8	3.6	59.56	22.21	570,000	25.8
32 B-3	2 inch	30.99	29.21	17.78	40.6	181.2	3.8	58.55	24.34	743,000	27.9

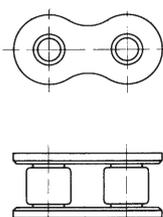
Spares for Std. Chains



Pin Unit (Rivetting Outer Links)

Available all sizes of chain. Press fit unit to connect chains for maximum performance

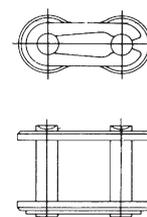
Part Ref. 79



Roller Unit (Inner Link)

Available all sizes of chain to extend chain length or manufacture of special build chains.

Part Ref. 77



Connecting Link (Spring Clip Type)

Standard all chains to 1 inch pitch. Should be assembled with open end away from running direction of chain.

Part Ref. 76

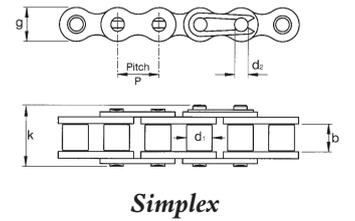
Stainless Steel, Extended Pitch and Factory Standard Chains



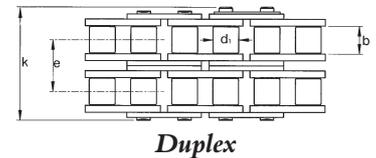
British Standard Stainless Steel Roller Chains

This series of chains are manufactured from corrosion resistant materials selected to provide long chain life. The standard chains are suitable for most food and drink applications and temperatures to 325°C. Chains with attachments can be supplied to order.

Cat. No.	Pitch P	Inside Width b min. mm	Roller ø d: max mm	Pin ø d: max mm	Plate Depth g mm	Con Pin Length k max mm	Transverse Pitch e mm	Bearing Area cm ²	Tensile Strength N	Weight kg/m
05B-1SS	8.00	3.0	5.0	2.31	7.1	11.7		0.11	3500	0.18
06B-1SS	3/8 inch	5.72	6.35	3.28	8.3	16.8		0.28	7000	0.41
08B-1SS	1/2 inch	7.75	8.51	4.45	11.8	20.9		0.50	12500	0.72
10B-1SS	5/8 inch	9.65	10.16	5.08	14.7	23.9		0.67	14500	0.95
12B-1SS	3/4 inch	11.68	12.07	5.72	16.2	27.3		0.89	18000	1.20
16B-1SS	1 inch	17.02	15.88	8.28	20.8	42.4		2.10	40000	2.70
06B-2SS	3/8 inch	5.72	6.35	3.28	8.3	25.1	10.24	0.55	13500	0.79
08B-2SS	1/2 inch	7.75	8.51	4.45	11.8	32.5	13.92	1.00	25000	1.44
10B-2SS	5/8 inch	9.65	10.16	5.08	14.7	37.6	16.59	1.34	29000	1.87
12B-2SS	3/4 inch	11.68	12.07	5.72	16.1	44.0	19.46	1.78	36000	2.52
16B-2SS	1 inch	17.02	15.88	8.28	21.2	70.7	31.88	4.21	80000	5.50



Simplex



Duplex

Plated Steel Roller Chains to British Standard Specifications

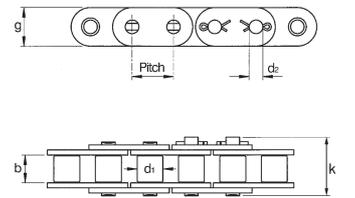
An alternate lower cost option to Stainless Steel Chains are standard steel chains finished with a protective plating. Although a number of treatments are available, only two are commonly used. Kanigan Electroless Nickel Plating provides a high corrosion resistant surface normally accepted in food applications, and suitable for many hostile environments. The chain retains its full mechanical properties and has higher wear resistance.

Molycoat Chains have a hard dry coating of lubricant including MOS₂. Not only does this provide an excellent lubricant base, but the chains also are able to operate efficiently at elevated temperatures with minimal maintenance.

Straight Sideplate Roller Chains to British Standard Dimensions

These provide increased bearing support for conveying applications.

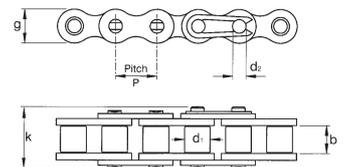
Cat. No.	Pitch P	Inside Width b min. mm	Roller ø d: max mm	Pin ø d: max mm	Plate Depth g mm	Pin Length k max mm	Bearing Area cm ²	Tensile Strength N	Weight kg/m
C12B-1	3/4 inch	11.68	12.07	5.72	16.1	27.3	0.89	29000	1.3
C16B-1	1 inch	17.02	15.88	8.28	21.0	41.5	2.10	64000	3.0
CL16B-1	1 inch	17.02	15.88	8.28	24.0	41.5	2.10	64000	3.2
C20B-1	1 1/4 inch	19.56	19.05	10.19	26.0	46.0	2.95	98000	4.1
C24B-1	1 1/2 inch	25.40	25.40	14.63	33.0	58.5	5.54	170000	7.9



Special Metric Pitch Chains

Two sizes of chains produced to metric pitch employed on a number of continental machines. M20 is a custom design whilst M30 is 16B chain extended to 30mm pitch.

Cat. No.	Pitch P	Inside Width b min. mm	Roller ø d: max mm	Pin ø d: max mm	Plate Depth g mm	Pin Length k max mm	Bearing Area cm ²	Tensile Strength N	Weight kg/m
M20	20mm	16.00	12.00	6.00	19.0	35.5	1.36	35500	2.00
M30	30mm	17.02	15.88	8.28	20.8	41.5	2.10	63000	2.33

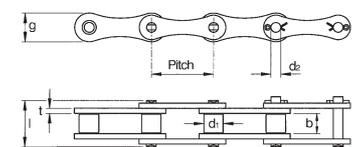


British Standard Double Pitch Chains

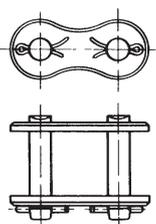
Double Pitch Chains use standard transmission chain pins, bushes, and rollers with link plates of double the pitch. These chains are used for both conveying and transmission on long centre distance drives, giving reduced weight and cost against the equivalent transmission chain.



Cat. No.	Pitch P	Inside Width b min. mm	Roller dia d1	Pin length l	Pin dia d2	Plate Depth g	Plate Thickness t	Bearing Area cm ²	Tensile Strength N	Weight kg/m
208B	1 inch	7.75	8.51	16.2	4.45	11.6	1.52	0.50	17800	0.46
210B	1 1/4 inch	9.65	10.16	19.3	5.08	14.5	1.60	0.67	22300	0.57
212B	1 1/2 inch	11.68	12.07	21.8	5.72	15.8	1.78	0.89	29000	0.75
216B	2 inch	17.02	15.88	34.0	8.28	20.5	4.06	2.10	64500	1.70
220B	2 1/2 inch	19.56	19.05	41.2	10.19	26.0	4.50	2.95	95000	2.50
224B	3 inch	25.40	25.40	53.4	14.63	33.0	6.00	5.54	160000	4.80

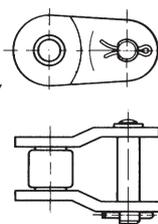


*Cat. No. equates to ISO 1275 Ref.



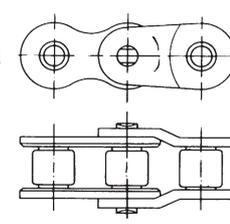
Connecting Link (Cottered Type)
For chains over 1" Pitch, for easy chain assembly

Part Ref. 75



Single Crank Link
Used to make chains of Odd Pitch Lengths - Standard on chains over 1" pitch and optional on chains up to 1".

Part Ref. 87



Double Crank Link
Preferred to Single Crank Link for small pitch chains. Available all chains to 1" pitch.

Part Ref. 86

Tel +44 121 360 0155

Fax +44 121 325 1079

Email sales@crossmorse.com

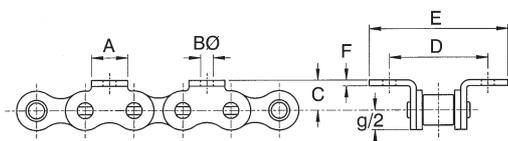
British Standard Roller Chain Attachments



The attachments below are available on 72 hour service built into the base roller chain at spacings to suit the application, K & M attachments can be fitted to only one side of the chain or both sides (as illustrated). Attachments of different types can be fitted in one chain assembly. In addition to these standard attachments, specials to suit customers' specific requirements can be supplied. Attachments can be assembled into Duplex and Triplex Chains, as well as standard Simplex. Nickel Plated chains can also be supplied to order. All Standard Attachments are made basically to ISO 606 Standard to ensure full interchangeability.

Bent Attachments

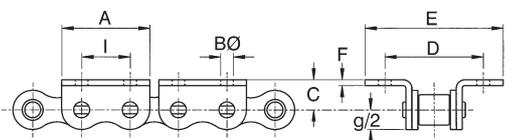
K1 - Single Hole Bent Attachment



Base Chain Ref.	Pitch P	Attach Width A	Hole Dia B	Plate Height C	Transverse Pitch D	Overall Width E	Plate Thick F
08B-1	1/2"	11.6	4.5	8.9	25.4	36.4	1.5
*08B-1	1/2"	11.6	4.2	8.9	23.8	36.0	1.5
10B-1	5/8"	12.8	5.3	10.3	31.8	45.1	1.5
12B-1	3/4"	16.6	7.1	13.5	38.1	57.7	1.8
16B-1	1"	18.9	6.8	15.9	50.8	74.8	3.2

*This attachment K1-M is to original British manufacturer's dimensions.

K2 - Two Hole Bent Attachment

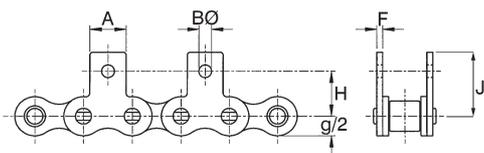


Base Chain Ref.	Pitch P	Attach Width A ₁	Hole Dia B	Plate Height C	Transverse Pitch D	Overall Width E	Plate Thick F	Hole Pitch I
08B-1	1/2"	23.2	4.5	8.9	25.4	36.4	1.5	12.7
10B-1	5/8"	29.3	5.3	10.3	31.8	49.4	1.5	15.9
12B-1	3/4"	33.0	6.6	13.5	38.1	56.5	1.8	19.1
16B-1	1"	45.9	6.8	15.9	50.8	78.2	3.2	25.4

Note:- If required plates can be supplied without holes, or with position/diameter of holes of non-standard sizes on short delivery.

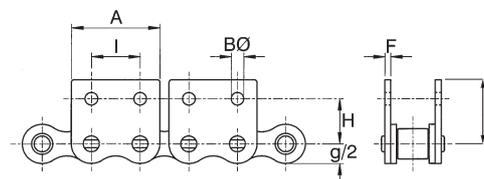
Straight Attachments

M1 - Single Hole Straight Attachment



Base Chain Ref.	Pitch P	Attach Width A	Hole Dia B	Hole Height H	Plate Height J	Plate Thick F
08B-1	1/2"	11.6	4.2	12.7	19.0	1.5
10B-1	5/8"	12.8	5.3	15.9	22.6	1.5
12B-1	3/4"	16.6	7.1	22.2	31.9	1.8
16B-1	1"	18.9	6.8	23.8	35.0	3.2

M2 - Two Hole Straight Attachment



Base Chain Ref.	Pitch P	Attach Width A ₁	Hole Dia B	Hole Height H	Hole Pitch I	Plate Height J	Plate Thick F
08B-1	1/2"	23.2	4.3	12.7	12.7	18.4	1.5
10B-1	5/8"	29.3	5.3	15.9	15.9	24.7	1.5
12B-1	3/4"	33.0	6.6	21.0	19.1	31.4	1.8
16B-1	1"	45.9	6.8	23.0	25.4	36.6	3.2

All K & M attachments can be supplied without holes, or with the holes of different diameters and positions to standard. Also special shape attachments can be provided to customers drawings.

All dimensions in mm except where stated.

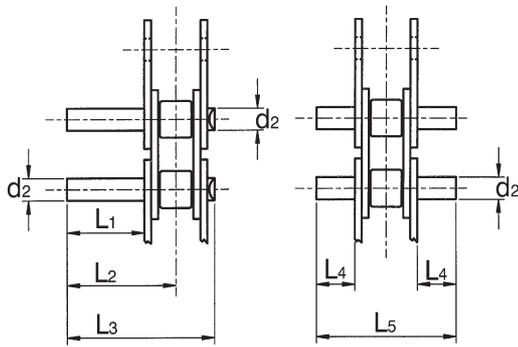
British Standard Roller Chain Attachments



Extended Pin Attachments

The extended pins can be assembled into the chain at positions to suit customers applications, or supplied loose as rivetting outers or connecting links. Normally used in pairs to support transverse tubes (when chain should be ordered as matched pairs) or sometimes in single strands to support or attach other attachments.

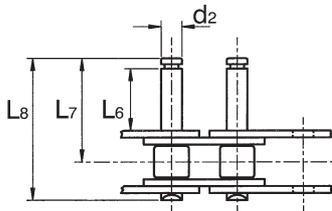
Straight Parallel Pins extended one side only E1, or equally extended both sides of chain E2. Attachments available with short or long pins.



Chain Ref	Attachment Ref.		E1 Short			E1 Long		E2 Short		E2 Long	
	Pitch P	Pin to \varnothing d_2	Extension L_1	Pin \varnothing L_2	Pin Length L_3	Extension L_1	Pin Length L_3	Extension L_4	Pin Length L_5	Extension L_4	Pin Length L_5
06B-1	3/8"	3.28	11.2	16.5	22.9	21.1	32.8	6.1	22.9	11.1	32.8
08B-1	1/2"	4.45	14.8	21.8	30.0	28.8	44.0	7.9	30.0	14.9	44.0
10B-1	5/8"	5.08	17.8	26.1	35.4	34.4	52.0	9.4	35.4	17.8	52.0
12B-1	3/4"	5.72	20.7	30.4	41.4	40.1	60.8	10.9	41.4	20.7	60.8
16B-1	1"	8.28	33.8	49.7	67.5	65.6	99.4	17.9	67.5	33.8	99.4
20B-1	1 1/4"	10.19	38.9	57.0	77.6	76.2	114.9	20.6	77.6	39.7	114.9
24B-1	1 1/2"	14.63	50.8	74.9	101.5	-	-	26.7	101.5	-	-
32B-1	2"	17.78	61.5	90.6	123.0	-	-	32.4	123.0	-	-

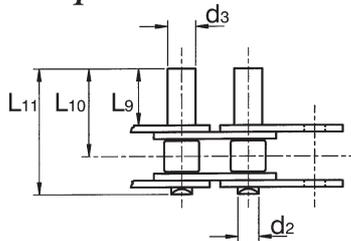
Single pin extensions can be assembled projecting on alternate sides of chain. Special length pins available on short delivery time.

Parallel Pins with grooves for circlip fixture location. Available short pins E3 attachment, or long pins - E4 attachment



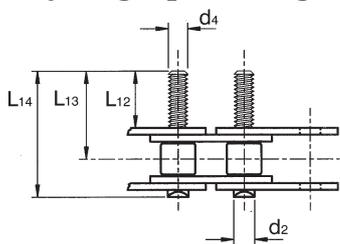
Chain Ref	Attachment Ref.		E3 Short Groove Pin			E4 Long Groove Pin		
	Pitch P	Pin to \varnothing d_2	Attach Length L_6	Pin \varnothing L_7	Pin Length L_8	Attach Length L_6	Pin \varnothing L_7	Pin Length L_8
06B-1	3/8"	3.28	-	-	-	10.7	17.9	24.3
08B-1	1/2"	4.45	7.2	17.0	25.1	14.2	23.1	31.3
10B-1	5/8"	5.08	9.5	21.2	30.5	17.0	27.3	36.6
12B-1	3/4"	5.72	11.8	25.3	36.3	19.5	32.0	43.0
16B-1	1"	8.28	15.8	36.9	54.7	32.2	51.9	69.1

Stepped Pins to provide additional bearing support area, ref. E5 and E6 (15mm pin 08B-1 only).



Chain Size	Pitch P	Attach Ref.	Pin dia d_2	Step Pin dia d_3	Step Pin Length L_9	Pin to \varnothing L_{10}	Overall Length L_{11}
08B-1	1/2"	E6	4.45	6.00	15.0	22.4	30.5
08B-1	1/2"	E5	4.45	6.00	34.0	41.4	49.5
10B-1	5/8"	E5	5.08	6.00	26.0	34.4	43.6
12B-1	3/4"	E5	5.72	8.00	25.0	34.8	45.6
16B-1	1"	E5	8.28	10.00	25.0	40.9	58.7

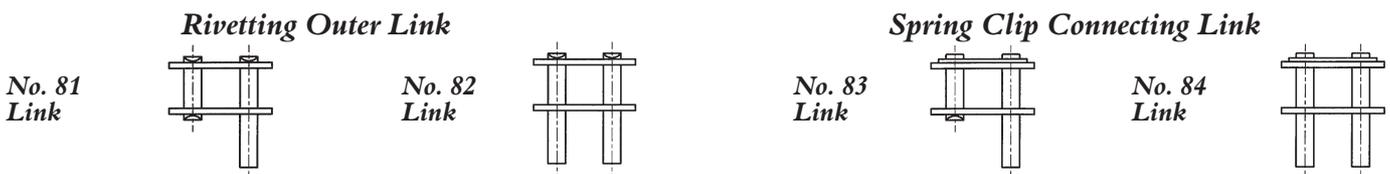
Threaded Pins for rigidly attaching carriers, ref E9, used in Gatherers in Book Binding machines



Chain Size	Pitch P	Attach Ref.	Pin dia d_2	Pin Thread dia d_4	Step Pin Length L_{12}	Pin to \varnothing L_{13}	Overall Length L_{14}
12B-1	3/4"	E9	5.72	M4	10.0	29.8	30.6

All dimensions in mm except where stated.

Loose Link Assemblies for Standard Chain 06B to 16B Chains. Use chain size and extended pin ref. to identify.



Many designs of special extended pins are manufactured for customer specific applications. Please consult Cross+Morse Engineering with your requirements.

Tel +44 121 360 0155

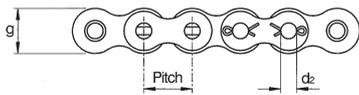
Fax +44 121 325 1079

Email sales@crossmorse.com

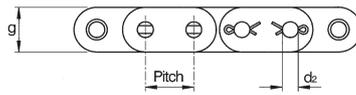
American Standard Precision Roller Chains Simplex (Single Strand) Construction



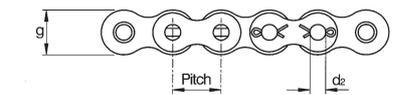
Conforming to ANSI B29.1 and ISO 606*



Standard Roller Chains



Straight Sideplate Roller Chains



Bush (Rollerless) Chains

*ISO 606 covers Standard Series Chains only

ANSI No.	Pitch P inches	Inside Width b min mm	Roller Ø d ₁ max. mm	Pin Ø d ₂ max. mm	Plate Depth g mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Bearing Area cm ²	Tensile Strength N	Approx Weight kg/m
•25	1/4	3.18	3.30 ₍₁₎	2.29	5.9	7.9	4.9	3.9	0.11	3,500	0.13
•35	3/8	4.77	5.08 ₍₁₎	3.58	9.0	12.0	8.7	6.0	0.27	8,400	0.31
41	1/2	6.35	7.77	3.58	9.9	13.2	9.4	6.6	0.32	8,000	0.42
40	1/2	7.85	7.95	3.96	11.8	16.6	10.7	8.3	0.44	14,800	0.62
50	5/8	9.40	10.16	5.08	15.0	20.2	14.3	10.1	0.70	24,400	1.04
60	3/4	12.60	11.91	5.94	18.0	25.0	16.3	12.5	1.06	34,400	1.48
80	1	15.80	15.88	7.92	24.0	32.6	18.8	16.3	1.79	64,500	2.50
100	1 1/4	19.00	19.05	9.53	30.0	39.2	23.2	19.6	2.62	100,000	3.76
120	1 1/2	25.25	22.23	11.10	36.0	49.4	29.0	24.7	3.94	130,000	5.50
140	1 3/4	25.25	25.40	12.70	42.0	53.0	31.0	26.5	4.72	177,000	7.20
160	2	31.55	28.58	14.27	48.0	63.2	37.1	31.6	6.50	227,000	9.80
180	2 1/4	35.50	35.71	17.45	54.5	71.5	44.2	35.8	8.87	320,000	13.0
200	2 1/2	37.85	39.68	19.85	59.5	77.0	47.3	38.5	10.90	360,000	16.3
240	3	47.35	47.63	23.80	72.0	95.5	57.7	47.8	16.15	520,000	25.3

Standard Series Chains (complying to ANSI b29.1)

Can be supplied also to full A.P.I. Specification with certified approval

• ANSI 25 and 35 are Bush Chains to ISO 1395

1) Bush Diameter

Heavy Series and High Endurance Chains

Morse High Strength Roller Chains are designed to meet the instantaneous peak loading requirements of all applications ranging from rugged construction equipment to elevated personnel carriers.

There are two series of chains, both operate on standard ANSI sprocket. The 'H' series have link plates of increased thickness to resist fatigue failure from shock and pulsating loads. Chains prefixed '8' have through hardened pins for additional strength where very high shock loads are encountered.

60H	3/4	12.60	11.91	5.94	18.0	28.3	16.6	14.2	1.15	34,000	1.70
80H	1	15.80	15.88	7.92	24.0	35.9	20.4	18.0	1.92	64,500	2.88
100H	1 1/4	19.00	19.05	9.53	30.0	42.5	25.0	21.3	2.77	100,000	4.55
120H	1 1/2	25.25	22.23	11.10	36.0	52.7	30.8	26.4	4.12	130,000	6.62
140H	1 3/4	25.25	25.40	12.70	42.0	56.0	32.6	28.0	4.93	177,000	8.45
160H	2	31.55	28.58	14.27	48.0	66.2	38.7	33.1	6.69	227,000	10.9
180H	2 1/4	35.50	35.71	17.45	54.5	75.0	44.5	37.5	9.14	320,000	13.6
200H	2 1/2	37.85	39.68	19.85	59.5	92.4	51.3	46.2	11.54	360,000	20.1

8-60H	3/4	12.60	11.91	5.94	18.0	28.3	16.6	14.2	1.15	40,000	1.70
8-80H	1	15.80	15.88	7.92	24.0	35.9	20.4	18.0	1.92	84,000	2.88
8-100H	1 1/4	19.00	19.05	9.53	30.0	42.5	25.0	21.3	2.77	120,500	4.55
8-120H	1 1/2	25.25	22.23	11.10	36.0	52.7	30.8	26.4	4.12	168,000	6.62
8-140H	1 3/4	25.25	25.40	12.70	42.0	56.0	32.6	28.0	4.93	224,000	8.45
8-160H	2	31.55	28.58	14.27	48.0	66.2	38.7	33.1	6.69	280,000	10.9
8-180H	2 1/4	35.50	35.71	17.45	54.5	75.0	44.5	37.5	9.14	380,000	13.6
8-200H	2 1/2	37.85	39.68	19.85	59.5	92.4	51.3	46.2	11.54	415,000	20.1

Straight Side Plate Chains

Provide increased bearing area for conveying applications, when sliding on guides. Operate on std. ANSI sprockets.

C40	1/2	7.85	7.95	3.96	11.7	16.6	10.7	8.3	0.44	14,800	0.67
C60	3/4	12.60	11.91	5.94	17.3	24.9	16.3	12.5	1.06	34,000	1.57
C80	1	15.80	15.88	7.92	24.2	32.6	18.8	16.3	1.79	64,500	2.79
C100	1 1/4	19.00	19.05	9.53	28.7	39.2	23.2	19.6	2.62	100,000	4.42
C120	1 1/2	25.25	22.23	11.10	36.1	49.4	29.0	24.7	3.94	130,000	6.55

Bush Chains

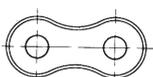
Standard ANSI Simplex chains assembled without rollers for reduced weight. Used on slow speed drives and lifting equipment such as, fork lift trucks.

ANSI No.	Pitch P inches	Inside Width b min mm	Roller Ø d ₁ max. mm	Pin Ø d ₂ max. mm	Plate Depth g mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Bearing Area cm ²	Tensile Strength N	Approx Weight kg/m
65	3/4	12.60	8.36	5.94	18.0	25.0	16.3	12.5	1.06	34,000	1.10
85	1	15.80	11.23	7.92	24.0	32.6	18.8	16.3	1.79	64,500	1.95
105	1 1/4	19.00	13.49	9.53	30.0	39.2	23.2	19.6	2.62	100,000	3.10
125	1 1/2	25.25	15.82	11.10	36.0	49.4	29.0	24.7	3.94	130,000	4.40

Detachable Chains

Detachable Chain can be supplied for chains of 3/4" pitch and above, in standard series, heavy series and high endurance series, add suffix 'C' to Part No. - e.g. 2" Pitch Triplex Detachable Chain - Ref. 160 - 3C.

Spares for Std. Chains



Pin Unit
(Rivetting Outer Links)

Available all sizes of chain. Press fit unit to connect chains for maximum performance

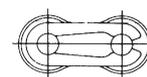
Part Ref. 79



Roller Unit
(Inner Link)

Available all sizes of chain to extend chain length or manufacture of special build chains.

Part Ref. 77



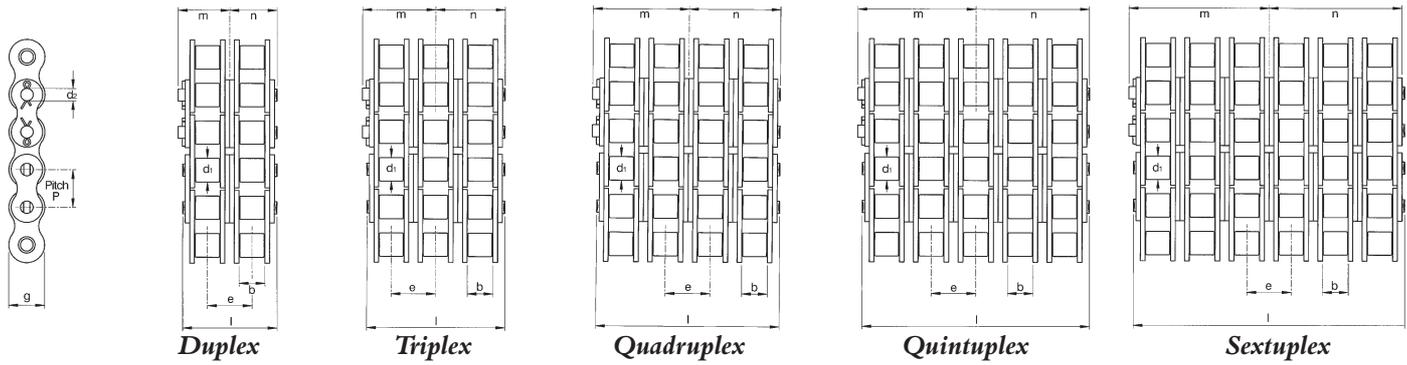
Connecting Link
(Spring Clip Type)

Standard all chains to 3/4 inch pitch. Should be assembled with open end away from running direction of chain.

Part Ref. 76

American Standard Precision Roller Chains Multi-Strand Constructions

Conforming to ANSI B29.1 and ISO 606*



All chains available to full A.P.I. specifications with certified approval. *ISO 606 covers Duplex and Triplex construction only.

Duplex Chains

• 25-2 & 35-2 Bush Chains to ISO 1395

1) Bush diameter.

Triplex Chains

• 25-3 & 35-3 Bush Chains to ISO 1395

1) Bush diameter.

Quadruplex Chains

Quintuplex Chains

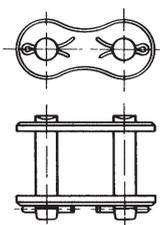
Sextuplex Chains

All dimensions in mm.

ANSI No.	Pitch P inches	Inside Width b min. mm	Roller Ø d ₁ max. mm	Pin Ø d ₂ max. mm	Plate Depth g mm	Transverse Pitch e mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Bearing Area cm ²	Tensile Strength N	Weight Approx. kg/m
•25-2	3/4	3.18	3.30 ₁₁	2.29	5.9	6.40	14.3	7.9	7.2	0.22	6,800	0.26
•35-2	3/8	4.77	5.08 ₁₁	3.59	9.0	10.13	22.0	11.9	11.0	0.54	16,800	0.65
40-2	1/2	7.85	7.95	3.96	11.8	14.38	30.9	16.8	15.2	0.88	29,600	1.22
50-2	5/8	9.40	10.16	5.08	15.0	18.11	38.3	21.2	19.2	1.40	48,800	2.00
60-2	3/4	12.60	11.91	5.94	18.0	22.78	48.1	26.4	24.1	2.12	68,000	2.85
80-2	1	15.80	15.88	7.92	24.0	29.29	61.8	33.6	30.9	3.58	129,000	5.00
100-2	1 1/4	19.00	19.05	9.53	30.0	35.76	75.3	41.3	37.7	5.24	200,000	7.60
120-2	1 1/2	25.25	22.23	11.10	36.0	45.44	95.3	52.0	47.6	7.88	260,000	10.8
140-2	1 3/4	25.25	25.40	12.70	42.0	48.87	102.6	55.6	51.3	9.44	354,000	14.2
160-2	2	31.55	28.58	14.27	48.0	58.55	122.6	66.7	61.4	13.00	454,000	19.0
180-2	2 1/4	35.50	35.71	17.48	54.5	65.84	137.2	74.7	68.6	17.75	640,000	26.2
200-2	2 1/2	37.85	39.68	19.84	59.5	71.55	150.9	83.4	75.4	21.80	720,000	32.0
240-2	3	47.35	47.63	23.80	72.0	87.83	184.1	99.5	92.1	32.30	1,040,000	49.5
•25-3	3/4	3.18	3.30 ₁₁	2.29	5.9	6.40	20.6	11.2	10.4	0.33	10,200	0.39
•35-3	3/8	4.77	5.08 ₁₁	3.59	9.0	10.13	32.2	17.9	16.1	0.80	25,200	0.97
40-3	1/2	7.85	7.95	3.96	11.8	14.38	45.2	24.6	22.4	1.32	44,500	1.83
50-3	5/8	9.40	10.16	5.08	15.0	18.11	56.4	30.6	28.2	2.10	73,300	2.97
60-3	3/4	12.60	11.91	5.94	18.0	22.78	70.9	38.1	35.5	3.18	102,100	4.35
80-3	1	15.80	15.88	7.92	24.0	29.29	91.1	48.4	45.6	5.73	193,600	7.90
100-3	1 1/4	19.00	19.05	9.53	30.0	35.76	111.1	59.2	55.6	7.86	300,000	11.4
120-3	1 1/2	25.25	22.23	11.10	36.0	45.44	140.7	74.7	70.4	11.82	390,000	15.8
140-3	1 3/4	25.25	25.40	12.70	42.0	48.87	151.6	80.2	75.8	14.16	531,000	21.5
160-3	2	31.55	28.58	14.27	48.0	58.55	181.2	96.1	90.6	19.50	681,000	26.3
180-3	2 1/4	35.50	35.71	17.48	54.5	65.84	203.0	107.2	101.6	26.63	960,000	39.6
200-3	2 1/2	37.85	39.68	19.84	59.5	71.55	222.4	119.5	111.2	32.70	1,080,000	47.7
240-3	3	47.35	47.63	23.80	72.0	87.83	272.0	143.4	136.0	48.45	1,560,000	73.8
40-4	1/2	7.85	7.95	3.96	11.8	14.38	59.6	31.8	29.6	1.76	59,300	2.44
60-4	3/4	12.60	11.91	5.94	18.0	22.78	93.7	49.3	46.9	4.24	136,000	5.86
80-4	1	15.80	15.88	7.92	24.0	29.29	120.4	62.8	60.2	7.16	232,000	10.07
100-4	1 1/4	19.00	19.05	9.53	30.0	35.76	146.8	77.0	73.4	10.48	384,000	15.0
120-4	1 1/2	25.25	22.23	11.10	36.0	45.44	186.1	97.3	93.1	15.76	520,000	22.6
140-4	1 3/4	25.25	25.40	12.70	42.0	48.87	200.4	104.8	100.2	18.88	705,000	29.9
160-4	2	31.55	28.58	14.27	48.0	58.55	239.7	125.5	119.9	26.00	908,000	38.8
200-4	2 1/2	37.85	39.68	19.84	59.5	71.55	293.9	155.2	147.0	43.60	1,440,000	63.3
240-4	3	47.35	47.63	23.80	72.0	87.83	359.8	187.3	179.9	64.60	2,080,000	98.5
60-5	3/4	12.60	11.91	5.94	18.0	22.78	116.5	60.6	58.3	5.30	170,000	7.32
80-5	1	15.80	15.88	7.92	24.0	29.29	149.7	77.5	74.8	9.31	290,000	12.6
100-5	1 1/4	19.00	19.05	9.53	30.0	35.76	182.6	95.0	91.3	13.10	480,000	18.8
120-5	1 1/2	25.25	22.23	11.10	36.0	45.44	231.6	120.1	115.8	19.70	680,000	28.2
140-5	1 3/4	25.25	25.40	12.70	42.0	48.87	249.3	128.6	124.7	23.60	920,000	36.2
160-5	2	31.55	28.58	14.27	48.0	58.55	298.3	154.0	149.2	32.50	1,160,000	52.9
60-6	3/4	12.60	11.91	5.94	18.0	22.78	139.3	81.9	79.5	6.36	204,000	8.78
80-6	1	15.80	15.88	7.92	24.0	29.29	178.9	102.0	99.4	11.46	348,000	15.10
100-6	1 1/4	19.00	19.05	9.53	30.0	35.76	218.4	122.9	119.2	15.72	576,000	22.5
120-6	1 1/2	25.25	22.23	11.10	36.0	45.44	277.0	153.1	148.8	23.64	816,000	33.9
140-6	1 3/4	25.25	25.40	12.70	42.0	48.87	318.1	163.0	159.0	28.32	1,105,000	43.4
160-6	2	31.55	28.58	14.27	48.0	58.55	376.8	193.2	188.4	39.00	1,395,000	58.1

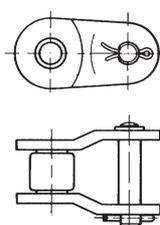
Detachable Chains

Detachable Chain can be supplied for chains 3/4" pitch and above. Add suffix 'C' to Part No. e.g. Ref 160-3C for 2" pitch Triplex Detachable Chain



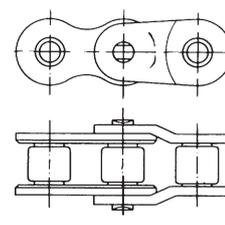
Connecting Link (Cottered Type)

For chains 3/4" Pitch and over for easy assembly of chains. Normally fitted slip fit plate except high endurance chains which are interference fit. Part Ref. 75



Single Crank Link

Used to make chains of Odd Pitch Lengths - Standard on all size ANSI Chains. Part Ref. 87



Double Crank Link

Preferred to Single Crank Link for small pitch chains. Available Chains to 3/4" pitch. Part Ref. 86

Tel +44 121 360 0155

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Email sales@crossmorse.com

American Standard Roller Chains Attachments

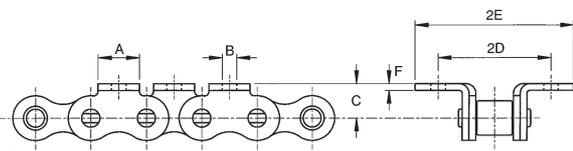


The following attachments are available built into the base roller chain at spacing to suit the application. B & S attachments can be fitted on one side only of chain or both sides (as illustrated). When fitted one side they are referred to as B1 or S1 attachments, but when fitted both sides they are referred to as B2 or S2 attachments. The attachments can also be fitted to Duplex chains, and different types of attachment can be mixed within one chain.

Bent Attachments

B1 - Single Hole Bent Attachment fitted one side chain only.

B2 - Single Hole Bent Attachments fitted both sides of chain (as illustrated).



Attachments available for both inner (roller) link and outer (pin) link. Connecting links with attachment as rivetted link, or as loose link can be supplied. All sizes available as rivetted construction, but ANSI 60 and larger can optionally be supplied as cottered construction if specified.

Chain ANSI No.	Pitches inches	Roller Ø max.	Attach Width A	Hole dia B	Plate Height C	Hole-offset D	Plate Width E	Plate Thick F	Add Wt B1 att grms
• 35	3/8"	5.08 ¹⁾	7.94	2.78	6.35	9.52	13.50	1.27	0.9
41	1/2"	7.77	9.53	3.17	7.14	11.90	17.46	1.27	1.4
40	1/2"	7.95	9.53	3.37	7.94	12.70	18.25	1.52	1.4
50	5/8"	10.16	12.70	5.16	10.32	15.87	23.02	2.03	3.6
60	3/4"	11.91	15.87	5.16	11.90	19.05	27.39	2.39	5.9
80	1	15.88	19.05	6.65	15.87	25.40	35.32	3.18	12.2
100	1 1/4"	19.05	25.40	8.33	19.84	31.75	42.86	3.96	25.0
120	1 1/2"	22.23	28.57	9.92	23.02	38.10	52.40	4.75	37.2
140	1 3/4"	25.40	34.92	11.51	28.57	44.45	57.55	5.56	64.0
160	2	28.58	38.10	13.10	31.75	50.80	68.30	6.35	90.0

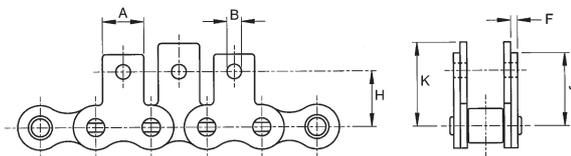
• ANSI 35 is Bush Chain
1) Bush diameter

All dimensions are in mm

Straight Attachments

S1 - Single Hole Straight Attachment fitted one side chain only.

S2 - Single Hole Straight Attachments fitted both sides of chain (as illustrated).



Attachments available for both inner (roller) link and outer (pin) link. Connecting links with attachment as rivetted link, or as loose link can be supplied. All sizes available as rivetted construction, but ANSI 60 and larger can optionally be supplied as cottered construction if specified.

Chain ANSI No.	Pitches inches	Roller Ø max.	Attach Width A	Hole dia B	Hole Height H	Outer Plate Ht. J	Inner Plate Ht. K	Plate Thick F	Add Wt S1 att grms
• 35	3/8"	5.08 ¹⁾	7.94	2.78	9.53	13.50	13.50	1.27	0.9
41	1/2"	7.77	9.53	3.17	12.30	17.85	17.85	1.27	1.4
40	1/2"	7.95	9.53	3.37	12.70	17.45	19.05	1.52	1.4
50	5/8"	10.16	12.70	5.16	15.87	22.65	24.60	2.03	3.6
60	3/4"	11.91	15.87	5.16	18.25	26.20	28.60	2.39	5.9
80	1	15.88	19.05	6.65	24.60	34.15	38.10	3.18	12.2
100	1 1/4"	19.05	25.40	8.33	31.75	42.10	46.45	3.96	25.0
120	1 1/2"	22.23	28.57	9.92	36.52	49.20	54.00	4.75	37.2
140	1 3/4"	25.40	34.92	11.51	44.45	57.95	63.50	5.56	64.0
160	2	28.58	38.10	13.10	50.80	66.30	73.00	6.35	90.0

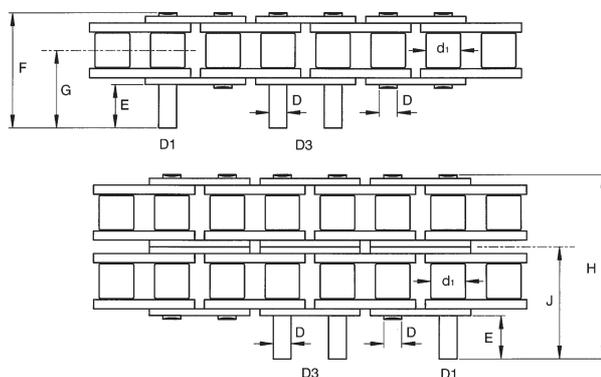
• ANSI 35 is Bush Chain
1) Bush diameter

All dimensions are in mm

Extended Pin Attachments

D1 - One Pin of outer link extended.

D3 - Both Pins of outer link extended.



Chain ANSI No.	Pitches inches	Roller Ø max.	Pin Ø D	Pin Extension E	Simplex Pin Lth. F	Simplex Pin to C/L2 G	Duplex Pin Lth. H	Duplex Pin to C/L2 J
• 35	3/8"	5.08 ¹⁾	3.58	9.53	20.64	14.72	30.95	19.95
41	1/2"	7.77	3.58	9.53	21.83	15.33	-	-
40	1/2"	7.95	3.96	9.53	24.60	16.60	38.90	23.47
50	5/8"	10.16	5.08	11.90	30.95	20.92	49.21	30.07
60	3/4"	11.91	5.94	14.30	38.10	25.53	61.12	37.08
80	1	15.88	7.92	19.05	50.00	33.82	79.37	48.48
100	1 1/4"	19.05	9.53	23.80	61.52	41.77	98.03	59.65
120	1 1/2"	22.23	11.10	28.60	76.20	51.31	121.44	73.83
140	1 3/4"	25.40	12.70	33.35	84.55	57.67	133.35	82.03
160	2	28.58	14.27	38.10	99.22	67.19	157.95	96.45

• ANSI 35 is Bush Chain

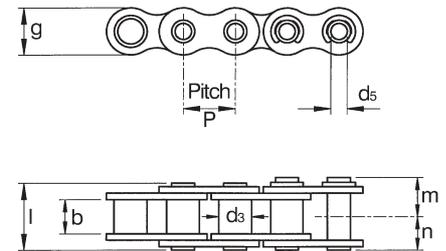
1) Bush diameter
2) Approx dimensions

All sizes available as rivetted construction, but ANSI 60 and larger can optionally be supplied as cottered construction if specified.

American Standard Attachment Chains and Corrosion Resistance Chains



Rollerless Hollow Pin Chains to ANSI Dimensions



Hollow Pin Chains allow unusual flexibility for conveyor applications. Because of the hollow pin design, many types of crossrods, pin and custom attachments may be inserted at any point without removing the chain from the drive system. Bushing diameters are the same as comparable chain rollers. These chains operate on standard sprockets. Standard packages contain two matched 10' lengths. When used on parallel strand conveyors, these strands should be installed directly opposite each other. A two-pitch offset section can be ordered to accommodate applications where an odd number of link is required.

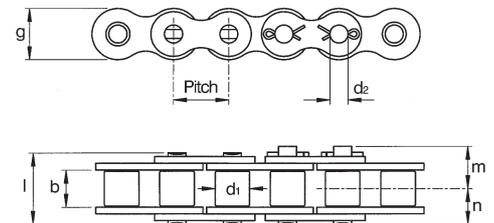
Cat. No.	Pitch P inches	Inside Width b min. mm	Bush Ø ds max. mm	Bore Ø ds max. mm	Plate Depth g mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Tensile Strength N	Weight Approx. kg/m
40HP	1/2	7.85	7.95	4.01	11.8	16.6	9.4	8.3	10,000	0.57
50HP	3/8	9.40	10.16	5.15	15.0	20.2	11.7	10.1	14,800	0.94
60HP	3/4	12.60	11.91	6.02	18.0	24.7	14.5	12.4	24,000	1.31
80HP	1	15.80	15.88	8.07	24.0	31.0	17.8	15.5	34,000	2.32

ANSI Stainless Steel Roller Chains

The standard series stainless chains are manufactured from 18-8 nickel chrome steel (300 Series). These chains can be used in corrosive environments, and at elevated temperatures up to 500°C. They are thus well suited to the high moisture, high temperature conditions found in many food preparation and packaging applications.

Where improved wear rates are required chains with round parts manufactured from 400 Series steels precipitation hardened for improved wear resistance, can be supplied. These chains have slightly less corrosion resistance, and can only operate up to 325°C.

Extended pin, K1 and M1 attachments in 18-8 materials can be provided assembled into chains, against specific order.

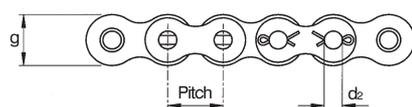


Cat. No.	Pitch P inches	Inside Width b min. mm	Roller Ø d1 max. mm	Pin Ø d2 max. mm	Plate Depth g mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Bearing Area cm²	Tensile Strength N	Weight Approx. kg/m
•25SS	1/4	3.18	3.30 ¹⁾	2.29	5.9	7.9	4.9	3.9	0.11	2,800	0.13
•35SS	3/8	4.77	5.08 ¹⁾	3.58	9.0	12.0	8.7	6.0	0.27	6,800	0.31
41SS	1/2	6.35	7.77	3.58	9.9	13.2	9.4	6.6	0.32	6,800	0.37
40SS	1/2	7.85	7.95	3.96	11.8	16.6	10.7	8.3	0.44	12,000	0.62
50SS	3/8	9.40	10.16	5.08	15.0	20.2	14.3	10.1	0.70	18,800	1.01
60SS	3/4	12.60	11.91	5.94	18.0	25.0	16.3	12.5	1.06	27,000	1.48
80SS	1	15.80	15.88	7.92	24.0	32.6	18.8	16.3	1.79	48,000	2.60
100SS	1 1/4	19.00	19.05	9.53	30.0	39.2	23.2	19.6	2.62	75,000	3.76
120SS	1 1/2	25.25	22.23	11.10	36.0	49.4	29.0	24.7	3.94	110,000	5.50

• Bush Chains. 1) Bush Diameter.
All sizes available rivetted construction only.

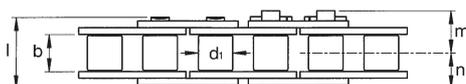
Nickel Plated Roller Chains to ANSI Standards

Chain components are electroless nickel plated to provide protection for mildly corrosive areas. Chain retains all physical properties of base chain. Attachments can be supplied to special order.



Cat. No.	Pitch P inches	Inside Width b min. mm	Roller Ø d1 max. mm	Pin Ø d2 max. mm	Plate Depth g mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Bearing Area cm²	Tensile Strength N	Weight Approx. kg/m
•35N	3/8	4.77	5.08 ¹⁾	3.58	9.0	8.7	6.0	0.27	8,400	0.31
40N	1/2	7.85	7.95	3.96	11.8	10.7	8.3	0.44	14,800	0.62
50N	3/8	9.40	10.16	5.08	15.0	14.3	10.1	0.70	24,400	1.01
60N	3/4	12.60	11.91	5.94	18.0	16.3	12.5	1.06	34,400	1.48

• Bush Chains.
1) Bush Diameter.
Chains available rivetted construction only.



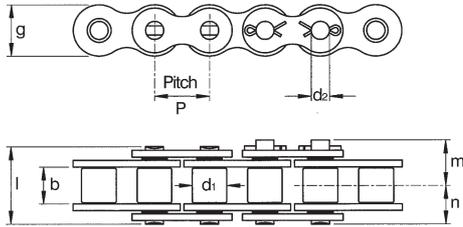
Maintenance Free American Standard Roller Chains



O-Ring Roller Chain

Morse O-Ring Chain is designed for those difficult applications where lubrication is inconvenient, impractical or expensive. The O-Rings between roller unit and pin seal in a special lubricant, so wear on internal pins and bushes is minimised. The O-Rings also keep out dust and other abrasive elements, thus protecting pins and bushes from damage. Retention of lubricant reduces friction, heat, wear and downtime.

Life of O-Ring chains can be minimised by occasional removal from drive and cleaning with paraffin or mineral spirits. After cleaning chain must be soaked in SAE 80 or 90 oil to coat 'O'-Rings and chain parts.



Cat. No.	Pitch P inches	Inside Width b min. mm	Roller Ø d: max. mm	Pin Ø d: max. mm	Plate Depth g mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Tensile Strength N	Weight Approx. kg/m
40-OR	1/2	7.85	7.95	3.96	11.8	18.00	20.60	9.00	14,600	0.66
50-OR	5/8	9.40	10.16	5.08	15.0	22.60	12.83	11.30	24,000	1.09
60-OR	3/4	12.60	11.91	5.94	18.0	28.70	16.38	14.35	34,250	1.55
80-OR	1	15.80	15.88	7.92	24.0	35.80	20.45	17.90	60,050	2.62
100-OR	1 1/4	19.00	19.05	9.53	30.0	44.20	24.38	22.10	97850	3.95

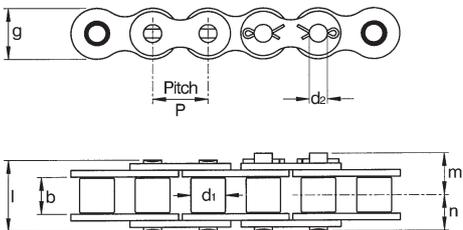
Sigma Sintered Bush Chain

Sigma Sintered Bush Chain combines the physical strength of ANSI Roller Chains with the self lubricating properties of special oil impregnated sintered metal bushes, to assure long reliable chain service where external lubrication is prohibited or extremely difficult to apply. The bush is precision formed from sintered steel, and impregnated with special lubricants. The oversize bush is press fitted into the inner link side-plates and protected by thin walled high performance roller.

Chain movement releases the oil to all bearing surfaces of bush, pin, plates and roller, minimising wear and power loss. The drive comes to rest, the lubricant is re-absorbed into the bush. Chain life extended by larger bearing areas.

Sigma SB Chain should not be used in temperatures above 100°C or at chain speeds over 5m/sec.

Sintered Bush Chain has increased breaking strength and fatigue strength compared to standard ANSI Chains.



Cat. No.	Pitch P inches	Inside Width b min. mm	Roller Ø d: max. mm	Pin Ø d: max. mm	Plate Depth g mm	Rivet Pin Length l max. mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Tensile Strength N	Weight Approx. kg/m
SG50	5/8	9.40	10.16	6.00	15.0	21.6	12.0	10.8	33,000	1.03
SG60	3/4	12.60	11.91	6.65	18.0	26.6	17.5	13.3	45,000	1.50
SG80	1	15.80	15.88	8.52	24.0	33.8	19.9	16.9	79,500	2.55

Thermoplastic Chains

Thermoplastic Chains provide an ideal solution for light duty conveying and transmission applications operating in harsh environmental conditions, moisture or chemicals, such as photographic developing equipment.

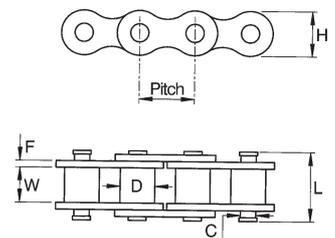
Available in four materials, Nylatron®, Delrin®, Polypropylene and Kynar® in chains to ANSI 25, 35 and 40 dimensions. These chains have simple connection (the outer links snap together), lightweight (less than 20% steel), low noise level, and natural lubricity. Dependant on material, excellent chemical resistance and non conductivity can be achieved, refer to table; and all chains are non magnetic.

A wide selection of attachments for conveying applications is also available.

A range of Nylatron sprockets to suit all pitches, with tooth sizes from 9 to 45 are available, although chains can be operated on standard steel or stainless steel sprockets. For further details on sprocket sizes and chain selection consult Cross+Morse technical sales.

Material Data	Nylatron	Delrin® Acetal	Polypropylene	Kynar® PVDF
Water Absorption % 24 hrs. 1/8 thk	0.8	0.25	0.01	0.05
Resistance: Effects of				
Weak Acids	resistant	resistant	very-very resistant	very resistant
Strong Acids	attacked	some	slowly	very resistant
Weak Alkalines	very-very resistant	resistant	very-very resistant	very resistant
Strong Alkalines	resistant	resistant	very resistant	attacked
Organic Solvents	resistant	resistant	resistant below 80°C	resistant to most

Catalogue No.	Dimensions mm								*Working Load kgs				Tensile Strength N			
	Pitch Ins	W Roller Width	D Roller Dia.	C Pin Dia.	F Plate Thick.	L Width Over Pins.	H Inside Plate Height	Material 1)				Material 1)				
								N	D	PP	K	N	D	PP	K	
ANSI 25 PC	1/4	3.2	3.3	2.7	1.0	9.1	6.4	3.2	3.6	1.4	2.7	220	209	98	186	
ANSI 35 PC	3/8	4.8	5.1	3.6	1.9	13.8	8.9	6.8	7.7	3.6	5.9	453	453	222	364	
ANSI 40 PC	1/2	7.9	7.9	4.0	2.2	18.4	11.7	9.1	10.0	4.5	7.2	578	583	298	471	



*Note: Values should only be used as a guideline. Application testing is strongly recommended. Use working loads for chain ratings. (1) N-Nylatron (GS) • D-Delrin (Acetal) • PP-Polypropylene • K-Kynar

†Total chain reference includes suffix for type of chain ie ANSI 25PC-D is Delrin.

®Delrin and Kynar are DuPont Trademarks

American Standard Double Pitch Roller Conveyor Chains



Conforming to ANSI B29.3 and B29.4

Double Pitch Roller Chains have twice the distance between rollers of corresponding standard roller chains. For example, ANSI No. 40 standard chain pitch is 1/2", ANSI No. 2040 chain pitch is 1". Since double pitch chains contain only half as many rollers, bushings and pins, they have lighter weight and greater economy than comparable standard chains. They are suited for applications with slow-to-moderate speeds, medium loads and long distances between sprockets, including a variety of conveyor systems and material handling equipment. ANSI transmission series chains feature figure-8 side plates and standard size rollers.

Transmission Series Chains to ANSI B29.3



Figure-8 contour of the transmission series side plates keeps chain weight to a minimum, and permits use of sprockets with maximum hub diameters. Link plate thickness, pins, bushes and rollers are same as corresponding standard roller chain.

ANSI No.	Pitch P inches	Inside Width b min. mm	Roller Ø d _r max mm	Pin Ø d _p max mm	Plate Depth g mm	Plate Thickness t mm	Rivet Pin Length l max mm	Length to Cotter Pin m mm	Length to Rivet Pin n mm	Bearing Area cm ²	Tensile Strength N	Weight Approx. kg/m
2040	1	7.85	7.95	3.96	11.8	1.52	16.6	10.7	8.3	0.44	14,800	0.45
2050	1 1/4	9.40	10.16	5.08	15.0	2.04	20.2	14.3	10.1	0.70	24,400	0.67
2060	1 1/2	12.60	11.91	5.94	18.0	2.38	25.0	16.3	12.5	1.06	34,000	1.02
2080	2	15.80	15.88	7.92	24.0	3.18	32.6	18.8	16.3	1.79	64,500	1.65
2100	2 1/2	19.00	19.05	9.53	30.0	3.96	39.2	23.2	19.6	2.62	100,000	2.89

Conveyor Series Chains to ANSI B29.4 - Standard and Large Diameter Rollers

Conveyor series chains with standard size rollers have straight side plates for increased bearing area when sliding on guides or supporting products. Large size rollers support the chain and load, holding them off the track to minimise friction and

power requirements. Chains 1 1/2" pitch or greater have side plates of same thickness as corresponding ANSI heavy series roller chains.

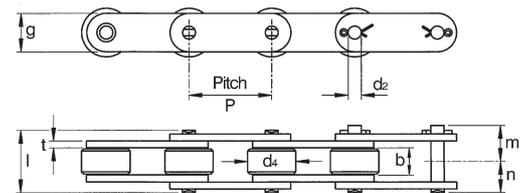
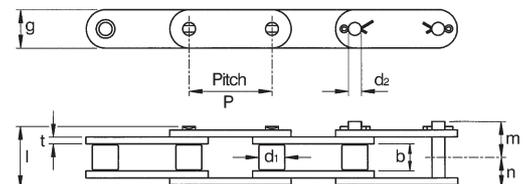
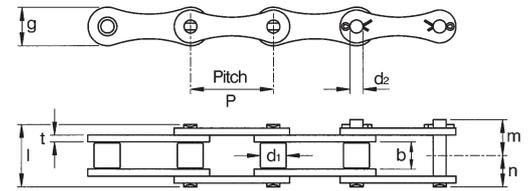
Standard Roller Series



Large Roller Series



Thermoplastic Large Roller Series



These chains are identical to large Roller Series except that the rollers are of thermoplastic material, reducing weight by approximately one third. Horsepower requirements are lower, and thermoplastic large rollers run quietly and smoothly; are tough and wear-resistant; require no lubrication and have improved resistance to corrosion. Chains with thermoplastic rollers are not recommended for operation below -17°C or above 80°C.

ANSI/CAT. Part No.			Pitch P inches	Inside Width b min.	Standard Roller dia. d _r max.	Large Roller dia. d _r max.	Side Plate		Pin dia. d _p max.	Rivet Pin Length l	Length to Conn Pin m	Length to Rivet Pin n	Tensile Strength N	Approx. Weight kg/m		
Standard Roller	Large Roller	Thermo-plastic					Height g	Thickness t						Standard Roller	Large Roller	Thermo-plastic
C2040	C2042	C2042D	1	7.85	7.95	15.88	11.7	1.52	3.96	16.6	10.7	8.3	14,800	0.48	0.82	0.49
C2050	C2052	C2052D	1 1/4	9.40	10.16	19.05	15.0	2.04	5.08	20.2	14.3	10.1	24,400	0.79	1.25	0.81
C2060H	C2062H	C2062D	1 1/2	12.60	11.91	22.23	17.6	3.18	5.94	28.3	16.6	14.1	34,000	1.37	2.10	1.40
C2080H	C2082H	C2082D	2	15.80	15.88	28.58	22.4	3.96	7.92	35.9	20.4	17.9	64,500	2.26	3.29	2.27
C2100H	C2102H	-	2 1/2	19.00	19.05	39.70	29.2	4.75	9.53	42.5	24.9	21.2	100,000	3.42	5.58	-
C2120H	C2122H	-	3	25.25	22.23	44.45	34.8	5.54	11.10	52.7	30.8	26.3	130,000	5.50	8.50	-
C2160H	C2162H	-	4	31.55	28.58	57.15	47.5	7.14	14.27	66.1	38.7	33.1	227,000	8.70	13.30	-

All dimensions in mm except as indicated.

Tel +44 121 360 0155

Fax +44 121 325 1079

Email sales@crossmorse.com

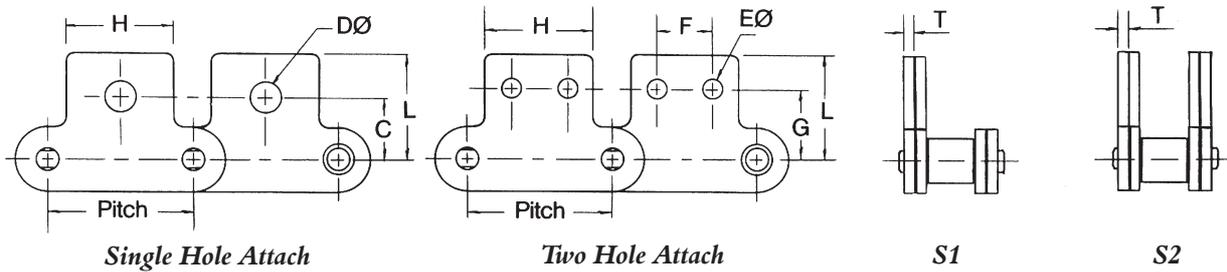
American Standard Double Pitch Chain Attachments



Attachments for Double Pitch Chains are available in three basic types; straight attachments for connecting components to the side of chain, bent attachments for mounting components over chain; and extended pins for supporting hollow tubes or for use as driving dogs. All attachments can be fitted to any series of base conveyor chains illustrated on page 23, and different types of attachments may be combined within one chain assembly

Straight Attachments - S1 & S2

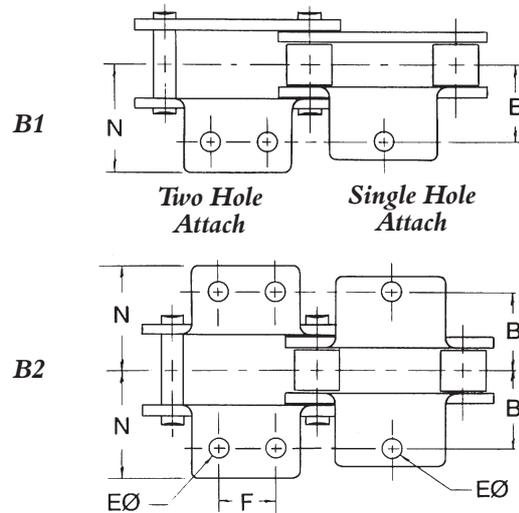
Available with either one or two hole attachments for both pin link and roller link. The links can be assembled into the chain on one side only - type S1, or both sides - type S2



Standard Chain No.	Pitch P inches	Single Hole Attach		Two Hole Attach			Std. Attach. Length	Attach. Height above Pin C.L.	Plate Thickness	Extra Weight Each Attach gms	
		C.L.Hole to C.L. Pin	Hole Dia.	Hole Dia.	Hole Centres	C.L.Hole to C.L. Pin				S1	S2
		C	D	E	F	G					
C2040	1	11.10	5.08	3.56	9.53	13.49	19.05	19.85	1.52	1.8	3.6
C2050	1 1/4	14.27	6.63	5.08	11.89	15.88	25.40	25.00	2.04	6.4	12.8
C2060H	1 1/2	17.48	8.20	5.08	14.27	19.05	28.58	30.00	3.18	15.9	31.8
C2080H	2	22.23	9.80	6.63	19.05	25.40	38.10	40.00	3.96	33.6	67.2
C2100H	2 1/2	28.58	13.11	8.20	23.83	31.75	47.63	50.40	4.75	60.0	120.0
C2120H	3	33.32	14.68	9.80	28.58	37.29	57.12	59.50	5.54	98.0	196.0

Bent attachments - B1 & B2

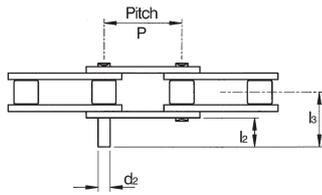
Available with either one or two attachment holes as single tab standard width attachments available for both pin and roller links. Attachments can be assembled into chain on one side only - type B1, or both sides - type B2



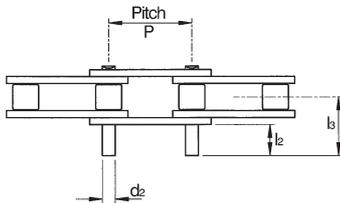
Standard Chain No.	Pitch P inches	Platform Height	Hole C.L. to Chain C.L.	Hole Dia.	Hole Centres	Attach. Length	Attach End to Chain C.L.	Plate Thickness	Extra Weight Each Attach gms	
		A	B						B1	B2
C2040	1	9.12	12.70	3.56	9.53	19.05	19.45	1.52	1.8	3.6
C2050	1 1/4	11.10	15.88	5.08	11.89	25.40	25.00	2.04	6.4	12.8
C2060H	1 1/2	14.68	21.44	5.08	14.27	28.58	30.55	3.18	15.9	31.8
C2080H	2	19.05	27.76	6.63	19.05	38.10	39.70	3.96	33.6	67.2
C2100H	2 1/2	23.42	33.32	8.20	23.83	47.63	50.00	4.75	60.0	120.0
C2120H	3	27.76	39.67	9.80	28.58	57.15	60.30	5.54	98.0	196.0

All dimensions in mm

American Standard Double Pitch Chains with Modified Pins and Stainless Steel Chains



D-1 Single Pin One Side



D-3 Double Pin One Side

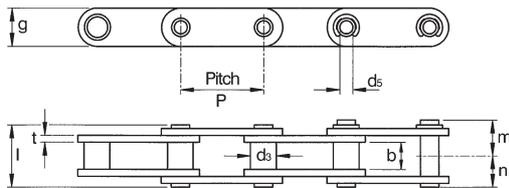
Extended Pin Chains - D Attachment

All standard conveyor chains can be supplied with rivet pin extended one side only. Either or both pins on a outer link can be extended, the spacing of extended pins within the chain assembly varied to suit application. These attachments may be combined with other attachments within one chain assembly.

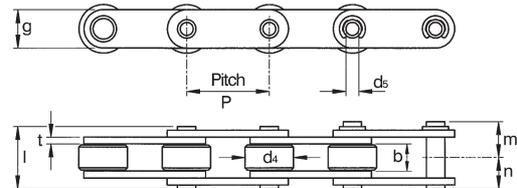
Standard Chain No.	Pitch P inches	Pin Dia. d ₂ max.	Pin Projection l ₂	End of Pin to C.L. Chain l ₃
C2040	1	3.96	9.52	16.66
C2050	1 1/4	5.08	11.89	21.03
C2060H	1 1/2	5.94	14.28	26.97
C2080H	2	7.92	19.05	34.93
C2100H	2 1/2	9.53	23.80	42.85
C2120H	3	11.10	28.57	52.37

Hollow Pin Chains - Rollerless and with Large Rollers

Hollow pin conveyor chains are used to support rods to carry wire mesh etc. The standard chain is of bush construction with bush diameter equal to the diameter of standard solid pin chain. Also available is chain fitted with conventional large diameter rollers. Note: These chains cannot be combined with other attachment.



Double Pitch Rollerless Hollow Pin Chain



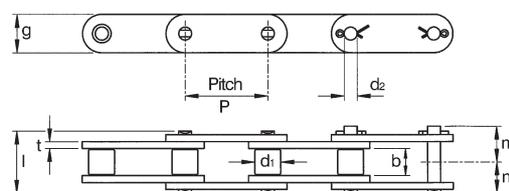
Double Pitch Large Diameter Roller Hollow Pin Chain

Cat. No.		Pitch P Inches	Inside Width b min.	Bush Diameter d ₃	Large Roller Diameter d ₄ max.	Pin Bore d ₅ min.	Sideplate		Rivet Pin Length l	Length to Conn. Pin m	Length to Rivet Pin n	Tensile Strength N	Approx. Weight kg/m	
Bush Chain	Large Roller Chain						Height g	Thickness t					Bush Chain	Large Roller Chain
C2040HP	C2042HP	1	7.85	7.92	15.88	4.01	11.7	1.52	16.6	9.4	8.3	10,000	0.46	0.80
C2050HP	C2052HP	1 1/4	9.40	10.16	19.05	5.15	15.0	2.04	20.2	11.7	10.1	14,800	0.76	1.25
C2060HP	C2062HP	1 1/2	12.60	11.91	22.23	6.02	17.6	2.39	24.7	14.5	12.4	24,400	1.12	1.79
C2080HP	C2082HP	2	15.80	15.88	28.58	8.07	22.4	3.18	31.0	17.8	15.5	34,000	1.98	3.17

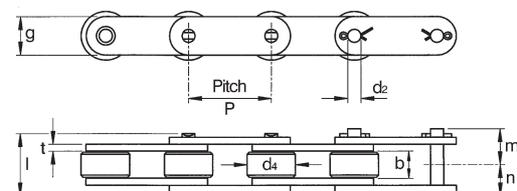
Stainless Steel Chains

Available in standard base chain with standard or large rollers, or chain with thermoplastic large rollers. Sideplate manufactured from 18-8 stainless steel with round parts using 17-7PH or 17-4PH materials, S and B attachments are available in 18-8 material, also D1 and D3 extended pins can be provided to special order.

The thermoplastic stainless chains, suffix DS, can be operated without lubrication, and provide quiet operation with high corrosion resistance. DS chains can only be used in applications within operating temperature range -17°C to 80°C.



Standard Roller Series



Large Roller and Thermoplastic Series

ANSI/Cat. Part No.			Pitch P Inches	Inside Width b min.	Standard Roller Dia. d ₁ max.	Large Roller Diameter d ₂ max.	Sideplate		Pin Bore d ₃ min.	Rivet Pin Length l	Length to Conn. Pin m	Length to Rivet Pin n	Tensile Strength N	Approx. Weight kg/m		
Standard Roller	Large Roller	Thermo-plastic					Height g	Thickness t						Standard Roller	Large Roller	Thermo-plastic
C2040SS	C2042SS	C2042DSS	1	7.85	7.95	15.88	11.7	1.52	3.96	16.6	10.7	8.3	12,000	0.55	0.89	0.57
C2050SS	C2052SS	C2052DSS	1 1/4	9.40	10.16	19.05	15.0	2.04	5.08	20.2	14.3	10.2	18,800	0.91	1.37	0.92
C2060SS	C2062SS	C2062DSS	1 1/2	12.60	11.91	22.23	17.6	2.39	5.94	24.9	16.3	12.5	27,000	1.07	1.80	1.10
C2080SS	C2082SS	C2082DSS	2	15.80	15.88	28.58	22.4	3.18	7.92	32.5	18.8	16.3	48,000	1.46	2.49	1.46
C2100SS	C2102SS	-	2 1/2	19.00	19.05	39.70	29.2	4.75	9.53	42.5	24.9	21.2	100,000	3.42	5.58	-
C2120SS	C2122SS	-	3	25.25	22.23	44.45	34.8	5.54	11.10	52.7	30.8	26.3	130,000	5.50	8.50	-

All dimensions in mm except as indicated.

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Cross+Morse Machine Shop Manufacturing System



In addition to our comprehensive range of Standard Sprockets and Platewheels to suit British and American Standard Chains, the modern machine shop facilities at Birmingham enable quick, cost effective production of custom designed sprocket assemblies and platewheels to suit most chain drive applications.

Special pulleys for all forms of Timing Belt Drives can be provided including tandem pulleys, units complete with freewheel and teeth cut direct onto shafting.

Specially manufactured gears to customers drawings include straight cut Mitre and Bevel gears up to 250mm diameter. Spur gears up to 1600mm diameter, and Helical gears up to 710mm diameter can be provided with either DP or Module tooth forms. Internal gears, splines and serrations can also be cut.

Straight Racks up to 2 metres individual length can be provided in a variety of materials with either DP or Module tooth forms, and for large drives segment gears can be machined.

Shafting up to 1 metre length can be supplied complete with required splines, keyseats or locking threads. Package drive systems combining the above products, or with enclosed cases, can be designed and manufactured in co-operation with our customers.

General Machining and Turning Department

Programmed Saws can provide blanks up to 420mm dia for turning, larger sizes or castings being sub-contracted from approved suppliers. CNC lathes with Power Tooling enable efficient low cost production of complex blanks including finished milled slots and drilled and tapped holes. Blanks up to 460mm dia, and 1 metre length can be handled, with bar feed facilities up to 65mm dia. The CNC lathes are supported by a selection of standard centre lathes, capstan lathes and vertical lathes up to 1500mm dia.

The department also includes Pillar and Radial Drills enabling quick production of setscrews and drilling for taper bore sprockets; and Universal Milling Machines.

Fine finishes and close tolerances of both base and outside diameters are achieved within the grinding area for diameters up to 300mm, and platewheels for Torque Limiters are face ground on Lumsden Grinder.



Gear Cutting Department

Our gear cutting facilities include a large number of Gear Shapers, mainly used for sprocket production up to 400mm dia, Gear Hobbers for gear and inverted tooth sprocket production up to 900mm dia, and a Sunderland Gear Planer for production all products up to 1500mm dia. Bevel Generators can provide mitres and bevels up to 250mm dia. A wide selection of tooling enables production of most forms of chain sprockets, timing belt pulleys and gears.

Although it is preferred to manufacture sprockets, pulleys or gears complete to ensure total quality control; capacity is available to cut teeth only on customers finished blanks.



Broaching and Keyseating

A number of horizontal broaching machines can handle work up to 3 metres diameter, with a wide selection of forms available from our stock of more than 1000 broaches including:-

Involute Tooth Splines from 22-76mm Outside Diameter.

Straight sided Serrations from 20-55mm Outside Diameter.

1 to 12 tooth straight sided splines from 7-57mm Outside Diameter.

Square Bores (Imperial) from 0.28-1.25 inches square.

Plus broaches for 'D' holes, holes with flats, hexagons, rectangles and inverted key holes.

All standard sizes of keyseats can be broached, and specials produced on vertical slotter.



Additional Facilities

Other production facilities which are used in the production of gearing products include:-

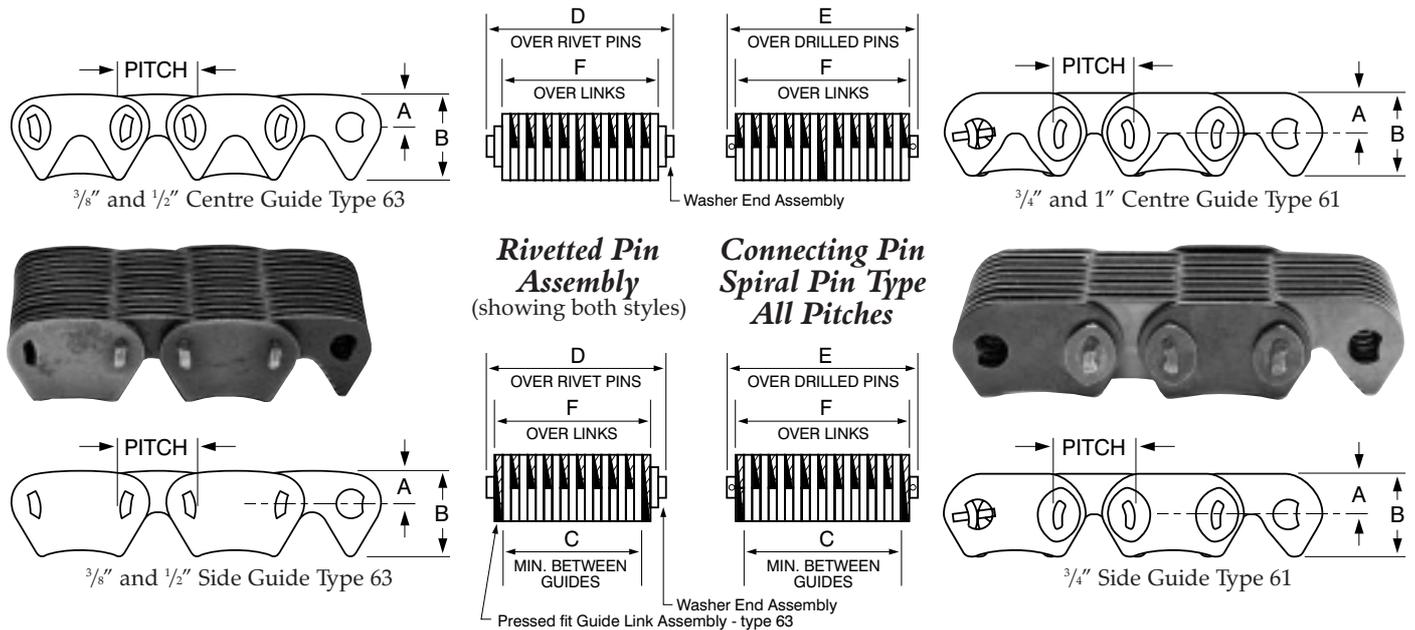
Induction Hardening for gears up to 450mm diameter and maximum 150mm thickness, ensures fast accurate hardening for both customised products and standard sprockets and gears.

Cold Chemical Blacking Plant used for finishing of standard sprockets to provide corrosion protection and good appearance, is available for all customised product if specified, and hot phosphate plant for timing pulleys and gears.

Both electric and Mig Co² Welding facilities for production of larger sprockets and gears up to 150mm diameter.

**For all your sprocket, pulley and gear requirements
contact Cross+Morse Engineering Sales for advice and price.**

RPV/HV Metric Chain Dimensions



Chain Dimensions - Metric Widths

Chain Designation	Nominal Width Inches	Chain Pitch ins (mm)	Chain Height above Spkt. PCD A mm	Chain Height B mm	Min Width between Guides C mm	Width over Links F mm	Width over Rivet Pin D mm	Width over Drilled Pins E mm	Average U.T.S. kN	Ave. Weight per Metre kg
3/8" PITCH 63 type HV										
RPV-302.2*	15				12.6	15.8	17.9	21.4	19	0.8
RPV-302.5*	17				14.2	17.4	19.5	23.0	21	0.8
HV-303*	20				17.4	20.6	22.7	26.1	25	1.0
RPV3-025	25	3/8"	4.3	10.9	-	26.5	31.0	33.9	35	1.4
RPV3-030	30	(9.525)			-	33.0	37.0	40.0	42	1.8
RPV3-040	40				-	39.0	44.0	47.2	56	2.1
RPV3-050	50				-	51.5	56.0	59.5	70	2.7
RPV3-065	65				-	64.0	69.0	72.1	87	3.3
1/2" PITCH 63 type HV										
HV-403*	20				17.4	20.6	22.7	26.1	33	1.3
RPV4-325	25				-	26.5	33.0	35.8	48	1.9
RPV4-330	30				-	33.0	39.0	41.8	58	2.3
RPV4-340	40	1/2"	5.7	14.5	-	39.0	45.0	47.6	77	2.8
RPV4-350	50	(12.70)			-	51.5	58.0	61.0	96	3.6
RPV4-365	65				-	64.0	70.0	73.0	125	4.4
RPV4-375	75				-	77.0	83.0	86.2	144	5.3
RPV4-3100	100				-	102.0	108.0	111.0	193	7.0
3/4" PITCH 61 type HV										
RPV-605.3*	30				27.0	31.2	38.5	42.0	88	3.4
RPV6-535	35				-	35.5	42.5	46.3	101	3.8
RPV6-540	40				-	43.5	50.5	54.0	116	4.6
RPV6-550	50				-	52.0	59.0	62.8	144	5.5
RPV6-565	65				-	68.5	75.5	79.0	188	7.1
RPV6-575	75	3/4"	10.3	20.9	-	77.0	84.0	87.6	217	8.0
RPV6-585	85	(19.05)			-	85.5	92.5	96.0	246	8.8
RPV6-5100	100				-	102.0	109.0	112.4	289	10.5
RPV6-5125	125				-	127.0	134.0	137.6	360	13.0
RPV6-5150	150				-	152.0	159.0	162.5	430	15.5
RPV6-5200	200				-	202.0	209.0	212.6	575	20.5
1" PITCH 61 type HV										
RPV8-640	40				-	41.0	49.0	55.0	154	5.9
RPV8-650	50				-	53.0	61.0	67.0	193	7.6
RPV8-665	65				-	65.0	73.0	79.0	250	9.3
RPV8-675	75	1"	13.7	27.8	-	77.0	85.0	91.0	289	11.0
RPV8-6100	100	(25.40)			-	102.0	110.0	116.0	385	14.4
RPV8-6125	125				-	127.0	135.0	141.0	482	17.7
RPV8-6150	150				-	152.0	160.0	166.0	578	21.1
RPV8-6200	200				-	201.0	209.0	215.0	770	27.8

* These Chains are outside guide type, all others are single centre guide Chains. These Chains are direct rivetted onto the outer link plates, all other Chains incorporate washers under the rivets. The HV Chains are standard imperial Chains, see previous page.

Design of HV6 and HV8 chains were changed in 1994 to provide increased Power Capacity. Chains to the original 61-115 design will remain in production for existing designs and replacement purposes. For new design 63-139 design chains will provide a more economical compact design, when specifying new series chain add suffix/139 to ensure the new chain is provided. If chain is ordered without suffix the original design will be supplied. *Note:* that 63-139 chains will not operate on 61-115 sprockets. Chain size up to 1 inch pitch are carried in stock in 10ft boxed lengths. Chains can be supplied in required length with cottered connecting links, or as rivetted endless assemblies. There are no offset links available for HV or RPV chains thus all chain lengths must be an even number of pitches. Widths other than listed above can be supplied for approved applications.

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HV Chain Installation and Lubrication

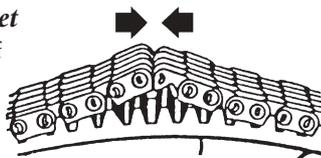


HV Chain Installation

HV Chains can be furnished rivetted endless, or open ended for connection with a standard connecting pin set. In some case designs, bearing carriers are large enough to install sprockets and endless chain through the openings. Other designs employ housings which are split at the shaft centre to facilitate installation. If chain is installed open ended, the procedures below may be used.

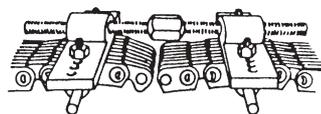
Connecting Chain using Sprocket

Bring ends of chain together on top of larger sprocket in mesh with sprocket teeth, and then insert connecting pin set.



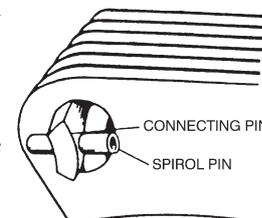
Connecting Chain between Sprocket

On pre-loaded, fixed centre distance drives a hook-up tool similar to that shown may be used to bring ends together.



Fitting Connecting Pin

When connecting the open ends with a pin set, it is important that the longer pin of the set must sit nearest to the outside flank of the guide plate. Spirol pin type connectors are normally used for connecting open ended chains. The spirol pin is driven into each end of the pin with a drift, for rivet type connectors. Washers are used on chains of 3/4" and above pitch of the original design 61-115 series chain.



Chain Case Structures

Morse HV Drives are normally on applications where high speed and/or high horsepower transmission is the requirement. The HV Drive should be installed in rigid housings of welded steel or cast construction, complete with shafts, bearings, seals and a proper lubrication system, in order to realise the full performance capability. There should be adequate clearance in chain case for chain to ride over sprockets (min. rad. = Spkt pitch rad + 1 1/4 chain pitch); and for centrifugal expansion of chain midway between sprockets (allow 12% Centre Distance beyond chain path each side of chain case). Side clearance beyond width of the chain should be equal to or greater than chain pitch.

Lubrication

A proper lubrication system with clean oil of the correct type is necessary for long, quiet, trouble free life of HV Drives. The lubricant must penetrate the chain joints to dissipate frictional heat and flush out foreign particles, and lubricate the surfaces of chain and sprocket contact.

Pressure Lubrication

For chain speeds above 13M/sec, pressure lubrication is required. The lubrication system should supply filtered oil at 4.5 litres/min. per 25mm width of chain. Spray pipes of 9.5mm I.D. with 2.5mm dia. orifices every 25mm will provide adequate lubrication with oil of SAE 20W or less at pressure of 1.5 Bar. The spray pipe should be located to spray onto the inside of chain as slack strand enters sprocket. A replacement element full flow oil filter capable of removing particles larger than 25 microns, with a built in relief valve, should be installed between the oil pump and spray pipe. A low oil pressure switch with warning is recommended. Additional components should include an oil sump strainer, oil fill/breather, magnetic drain plug and an oil level sight gauge. Lubrication should also be provided to the shaft bearings.

Bath Lubrication

At chain speeds below 13M/sec bath lubrication may be satisfactory. With bath lubrication, the dynamic oil level should be maintained at the lowest point of the chain pitch line, and for this purpose an oil level sight gauge is desirable.

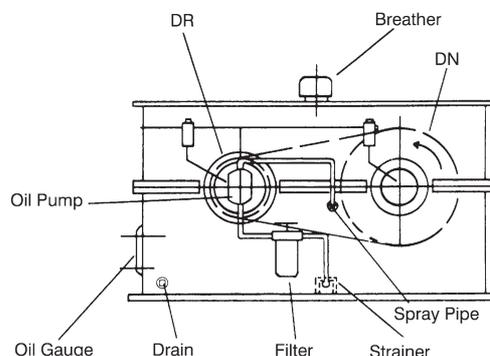
Lubrication Oil Specification

Satisfactory HV chain drive performance depends upon the use of well refined, high quality oil. The best lubricant is Automatic Transmission Fluid (ATF), but light detergent oils as used in Automotive Engines, and Turbine and Spindle Oils are also acceptable. Multiple viscosity oils, gear oils or EP compound oils should not be used. For maximum performance, use oils with SAE Grade related to operating temperature in chart.

Oil Viscosity Recommendations

Surrounding Ambient Temp.	SAE Grade Viscosity	Viscosity Saybolt Secs at 38 °C
Under 4 °C	SAE 5*	150 SSU
4 °C to 32 °C	SAE 10*	200 SSU
Over 32 °C	SAE 20	300 SSU

*Use Type A or B Automatic Transmission Fluid (ATF)



Where applications require oil in excess of SAE 20 Grade consult Morse Engineering

It is desirable to limit oil temperature to 80 °C to prevent rapid deterioration. If necessary external cooling fans or oil cooler should be used to achieve this. Generally HV Chains operate with a temperature rise of approx. 25 °C above ambient temperature.

Lubrication Changes

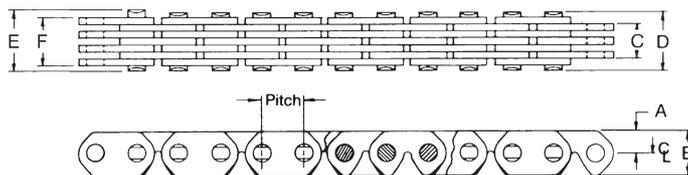
Oil should be kept clean to assure long trouble free service. If oil becomes dirty or appears to be contaminated it should be replaced. Good practice is to change oil every 1000 hours or 4 months whichever occurs first, but longer intervals are acceptable if operating conditions allow. When oil is changed, the case should be drained and flushed with suitable solvent. Inspection of lubrication piping, pump and spray pipe orifices should be made, and filter element replaced if dirty. The drive must be kept free of water and foreign material at all times.

SC03 - 3/16" Pitch Round Pin Inverted Tooth Chains



The 3/16" pitch 'SC' chains use a simple round pin construction for maximum strength and durability. Chains are available in both centre guide and single outside guide constructions in all widths, but it is normal for narrow width chains to be outside guide. The chains articulate fully on the pin, and as such tensioners can be used on the back of the chain; also the chains can be built with sets of teeth opposed to one another for serpentine drives. Tiny drives can be achieved with these chains, with power capacity up to 4 kW, and operating speeds to 10,000 rpm. All 3/16" pitch inverted tooth chain sprockets are manufactured to customer requirements, normally manufactured from induction hardened steel. Complete chain drive design and fabrication is available to meet your individual requirements. A range of Stainless Steel chains is also available for use in Food Process and Handling Machinery. These chains are manufactured from hardened, corrosion resistant, 304 grade Stainless Steel.

Chain lengths must be of even number of pitches, as offset links are not available with these series of chains.



Typical Applications

- Check Weighers - used to convey product over scales
- Postage Machinery - high operating speeds possible
- Copying Machines - transmit high loads in confined space
- Aircraft Controls - Accurate transfer of motion
- Machine Tools - Compact high torque drives
- Conveyors - handling hot small components

Chain Dimensions - 3/8" SC Series Chains

'SC' Chain Designation	Nominal Width Inches	Chain Pitch ins(mm)	Chain Ht. over Spkt. PCD A mm	Chain Height B mm	Guide Type	Width between Guide Links C mm	Width over Links F mm	Width over Rivet Pin D mm	Width over Conn Pins E mm	Average U.T.S. kN	Ave. Weight per Metre kg
R0305	5/32				CG		4.0	5.1	6.3	2.22	0.1
SC0305	5/32				SOG	2.4	4.0	5.1	6.3	2.22	0.1
R0307	7/32				CG		5.6	6.7	7.9	3.34	0.2
SC0307	7/32				SOG	4.0	5.6	6.7	7.9	3.34	0.2
R0309	9/32				CG		7.1	8.2	9.4	4.45	0.2
SC0309	9/32				SOG	5.6	7.1	8.2	9.4	4.45	0.2
R0311	11/32	3/16"	2.4	5.1	CG		8.7	9.8	11.0	5.56	0.2
SC0311	11/32	(4.76)			SOG	7.1	8.7	9.8	11.0	5.56	0.2
SC0315	15/32				SOG	10.3	11.9	13.0	14.2	7.78	0.3
R0315	15/32				CG		11.9	13.0	14.2	7.78	0.3
SC0319	19/32				CG		15.1	16.2	17.4	10.00	0.4
R0319	19/32				SOG	13.5	15.1	16.2	17.4	10.00	0.4
SC0325	25/32				CG		19.8	20.9	22.1	13.35	0.5
R0325	25/32				SOG	18.3	19.8	20.9	22.1	13.35	0.5
SC0331	31/32				CG		24.6	25.7	26.9	16.70	0.6
R0331	31/32				SOG	23.0	24.6	25.7	26.9	16.70	0.6

Standard Chains are in bold typeface

Chain Dimensions - 3/8" SC Series Stainless Steel Chains

'SC' Chain Designation	Nominal Width Inches	Chain Pitch ins(mm)	Chain Ht. over Spkt. PCD A mm	Chain Height B mm	Guide Type	Width between Guide Links C mm	Width over Links F mm	Width over Rivet Pin D mm	Width over Conn Pins E mm	Average U.T.S. kN	Ave. Weight per Metre kg
SC0305SS	5/32				SOG	2.4	4.0	5.1	6.3	2.00	0.1
SC0307SS	7/32				SOG	4.0	5.6	6.7	7.9	3.34	0.2
SC0309SS	9/32				SOG	5.6	7.1	8.2	9.4	4.45	0.2
SC0311SS	11/32				SOG	7.1	8.7	9.8	11.0	5.56	0.2
SC0315SS	15/32	3/16"	2.4	5.1	SOG	10.3	11.9	13.0	14.2	7.78	0.3
R0315SS	15/32	(4.76)			CG		11.9	13.0	14.2	7.78	0.3
SC0319SS	19/32				CG		15.1	16.2	17.4	10.00	0.4
R0319SS	19/32				SOG	13.5	15.1	16.2	17.4	10.00	0.4
SC0325SS	25/32				CG		19.8	20.9	22.1	13.35	0.5
R0325SS	25/32				SOG	18.3	19.8	20.9	22.1	13.35	0.5
SC0331SS	31/32				CG		24.6	25.7	26.9	16.70	0.6
R0331SS	31/32				SOG	23.0	24.6	25.7	26.9	16.70	0.6

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American Standard SC Series Inverted Tooth Chains



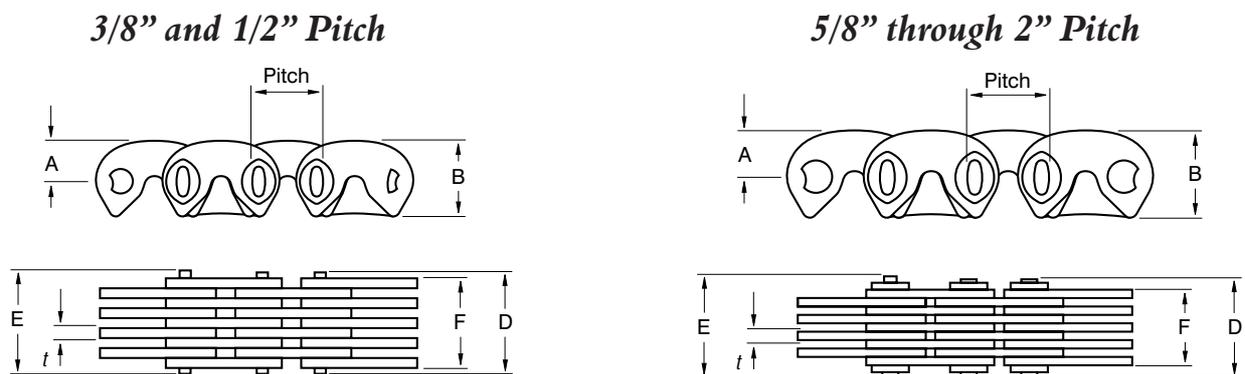
Cross+Morse 'SC' Series Inverted Tooth chains are manufactured to meet the American Standards ASME(ANSI) B29.2, and will operate on Sprockets manufactured to that Standard. Chains of other manufacture, often identified with letters 'SC' stamped on the outer plates, can be replaced, but only as complete chains, because the ASME Standard allows manufacturers individual design within the concept, so although all chains will operate on the standard sprockets, chains from different manufacturers will not usually connect together. All Cross+Morse chains use the Pin and Rocker design developed in the 'HV' series chains, so eliminating friction and chordal action during articulation allowing the chains to me operated at speeds up to 35 metres/sec, with negligible wear or heat generation. Improved Link design combined with the 'HV' type pins has enabled higher loads to be transmitted, with the chains having twice the power capacity specified in the Standard. The improved Link design reduces stress concentrations giving improved fatigue life and increased tensile strength. Innovative stamping methods in link production maximise the bearing surface area of each link, reducing stress in the chain joint, and chain elongation when operating. All chain links are shot peened to improve fatigue resistance and provide a uniform finish.

The new series 'SC' chains suffer minimal wear elongation during operation, making them well suited to 'fixed centre' drive applications. The chains can also be used to replace other manufacturers chains on existing applications to increase power ratings.

The 'SC' chains are available in standard Centre Guide construction, as shown in the following table; or with either Single or Double Outside Guides, as shown in tables on pages 82/83. Other widths and guiding arrangements from the standards shown can be supplied as replacements on existing drives on short lead time.

Our Standard 'SC' Chains are not suitable for Conveying applications, due to the curved back of the links. We are also able to offer an earlier series of chains, which do have flat back surface, to fit SC Sprockets. This 'Original Series SC Chain' is available to order on chains up to 1" pitch. Round Pin chain is also available to request in 3/8" to 3/4" pitch, for applications requiring to run on small sprockets, or subject to back-bending in operation.

It is desirable on all Inverted Tooth Chain drives to design installations so that chains have an even number of pitches, but on 'SC' if this is not possible we can provide Offset (Hunting) Link sets to accommodate odd pitch length chains. Chains will normally be supplied in requested length complete with Cotter Pin Joining Pin, but can also be supplied rivetted endless if required.



Chain Dimensions - SC Series Centre Guide Chains Imperial Widths

'SC' Chain Designation	Nominal Width Inches	Chain Pitch ins(mm)	Chain Ht. over Spkt. PCD A mm	Chain Height B mm	Guide Type	Width over Links F mm	Width over Rivet Pin D mm	Width over Drilled Pins E mm	Average U.T.S kN	Ave. Weight per Metre kg
R302†	1/2				CG	14.3	16.3	17.8	17	0.7
SC303	3/4				CG	20.6	22.6	24.0	25	1.0
SC304	1				CG	27.0	29.0	30.5	33	1.3
SC305	1.1/4				CG	33.4	35.3	36.8	42	1.6
SC306	1.1/2				CG	39.8	41.7	43.2	50	1.9
SC307	1.3/4	3/8" (9.525)	5.6	10.7	CG	46.2	48.1	49.6	67	2.2
SC308	2				CG	52.5	54.4	55.9	75	2.5
SC310	2.1/2				CG	65.3	67.2	68.8	83	3.1
SC312	3				CG	78.1	80.0	81.5	100	3.7
SC316	4				DCG*	103.6	105.6	107.2	133	4.9
SC403	3/4				CG	20.6	23.6	25.4	33	1.3
SC404	1				CG	27.0	30.0	32.0	44	1.7
SC405	1.1/4				CG	33.4	36.3	38.1	56	2.1
SC406	1.1/2				CG	39.8	42.7	44.5	67	2.5
SC407	1.3/4				CG	46.2	49.0	51.0	78	2.9
SC408	2				CG	52.5	55.4	57.2	89	3.3
SC410	2.1/2				CG	65.3	68.1	70.1	111	4.1
SC412	3				CG	78.1	80.9	82.8	133	4.9
SC414	3.1/2	1/2" (12.70)	7.6	14.2	CG	90.8	93.7	95.5	156	5.7
SC416	4				DCG*	103.6	106.4	108.2	178	6.5
SC420	5				DCG*	129.1	132.1	133.9	222	8.1
SC424	6				DCG*	154.6	157.5	159.3	267	9.7
SC428	7				DCG*	180.1	183.0	185.0	356	11.3

* The Guide Spacing on Double Centre Guide Chains varies by manufacturer, it is thus necessary to provide this dimension when ordering. The dimension can be taken from either the chain to be replaced, or the sprockets, and should be from centre to centre of link or groove.

†SC302 Chain is a Single Side Guide construction chain, see page 82.

American Standard SC Series Inverted Tooth Chains



Chain Dimensions - SC Series Centre Guide Chains Imperial Widths

'SC' Chain Designation	Nominal Width Inches	Chain Pitch ins(mm)	Chain Ht. over Spkt. PCD A mm	Chain Height B mm	Guide Type	Width over Links F mm	Width over Rivet Pin D mm	Width over Drilled Pins E mm	Average U.T.S kN	Ave. Weight per Metre kg
SC504	1				CG	26.8	33.0	35.0	56	2.5
SC506	1.1/2				CG	39.2	45.3	47.4	83	3.5
SC508	2				CG	51.7	57.7	59.8	111	4.6
SC510	2.1/2				CG	64.1	70.1	72.1	139	5.6
SC512	3	5/8" (15.88)	9.5	17.8	CG	76.5	82.6	84.6	167	6.7
SC514	3.1/2				CG	88.9	94.7	96.8	195	7.8
SC516	4				CG	101.3	107.2	109.2	222	8.8
SC520	5				CG	126.2	132.0	134.0	278	10.9
SC524	6				CG	151.0	157.0	159.0	334	13.0
SC604	1				CG	26.8	33.6	35.6	67	3.0
SC606	1.1/2				CG	39.2	46.2	48.3	100	4.2
SC608	2				CG	51.7	58.4	60.5	133	5.5
SC610	2.1/2				CG	64.1	71.1	73.2	167	6.8
SC612	3	3/4" (19.05)	10.9	21.3	CG	76.5	83.4	85.4	200	8.0
SC614	3.1/2				CG	88.9	95.7	97.7	233	9.3
SC616	4				CG	101.3	108.2	110.2	267	10.6
SC620	5				CG	126.2	133.1	135.2	334	13.1
SC624	6				CG	151.0	158.0	160.0	400	15.6
SC628	7				CG	175.9	182.8	184.9	467	18.2
SC632	8				CG	200.7	207.7	209.7	534	20.7
SC806	1.1/2				CG	34.7	44.0	46.8	133	4.9
SC808	2				CG	47.4	57.4	60.2	178	6.5
SC810	2.1/2				CG	60.1	69.7	72.5	222	8.0
SC812	3				CG	72.8	81.0	85.1	267	9.6
SC816	4				CG	98.2	107.4	110.2	356	12.7
SC820	5				CG	123.6	131.6	134.4	445	15.8
SC824	6	1" (25.40)	15.2	28.4	CG	149.0	156.0	159.8	534	18.9
SC828	7				CG	174.4	188.7	191.5	623	22.0
SC832	8				CG	199.8	213.6	216.4	712	25.1
SC840	10				CG	250.6	263.7	266.4	890	31.3
SC848	12				CG	307.8	316.0	319.0	1068	37.5
SC1212	3				CG	72.9	84.3	84.3	400	14.0
SC1216	4				CG	98.4	108.7	108.7	534	18.6
SC1220	5				CG	123.8	134.1	134.1	667	23.1
SC1224	6				CG	149.3	159.5	159.5	801	27.7
SC1228	7	1/1/2" (38.10)	22.8	42.7	CG	174.7	184.9	184.9	934	32.2
SC1232	8				CG	200.1	210.6	210.6	1068	36.7
SC1236	9				CG	225.6	236.5	236.5	1201	41.3
SC1240	10				CG	254.2	264.7	264.7	1334	45.8
SC1616	4				CG	98.2	110.2	110.2	712	24.7
SC1620	5				CG	123.6	135.6	135.6	890	30.8
SC1624	6				CG	149.0	161.0	161.0	1068	36.8
SC1628	7	2" (50.80)	30.4	57.0	CG	174.4	186.4	186.4	1246	42.9
SC1632	8				DCG*	199.8	211.8	211.8	1423	48.9
SC1640	10				DCG*	250.6	262.6	262.6	1779	61.1
SC1648	12				DCG*	301.4	313.4	313.4	2135	73.2
SC1656	14				DCG*	358.6	370.6	370.6	2491	85.3
SC1664	16				DCG*	409.4	421.4	421.4	2847	97.4

* The Guide Spacing on Double Centre Guide Chains varies by manufacturer, it is thus necessary to provide this dimension when ordering. The dimension can be taken from either the chain to be replaced, or the sprockets, and should be from centre to centre of link or groove

For Installation and Lubrication information refer to HV data on page 78. For any further Technical information contact our Technical Sales Dept. at Birmingham.

Order Information

If chain part number not available when ordering replacement chain, the following information should be supplied.

- Chain Pitch** Distance between centres of Teeth Tips when chain laid flat.
- Chain Width** Distance over Link Plates.
- Guiding** Centre or Outside Guide.
- Inside Width** Outside guide chains only, distance between guides.
- Pin Length** Length of rivet and connecting pins, if clearance critical.
- No. Pitches** No. pitches of chain which make closed chain.

If the chain you require to replace is not shown above, or you require assistance in identification or drive design, contact our Technical Sales Dept.

Tel +44 121 360 0155

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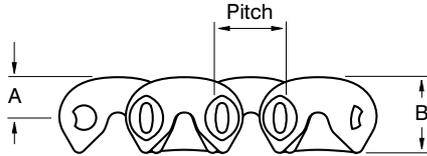
Email sales@crossmorse.com

Outside Guide SC Series Inverted Tooth Chains

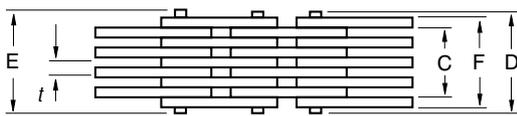
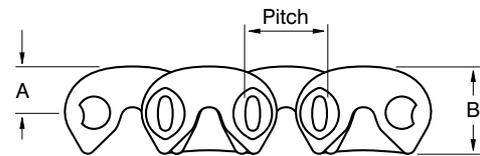


Cross+Morse Outside Guide Inverted Tooth Chains are intended solely as replacement chains for existing applications, and hence the part numbers are all prefixed 'R'. All chains run on sprockets gearcut to specifications of tooth form in ASME(ANSI) B29.2, but with the exception of SC302 all other chain dimensions are outside the Standard, but to Industry preferred sizes. In addition to replacement chains we can provide replacement Sprockets manufactured with the latest material and heat treatment to provide a longer service life.

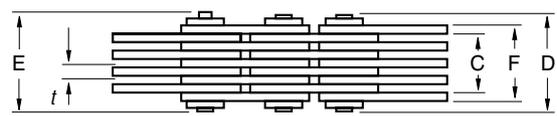
3/8" and 1/2" Pitch



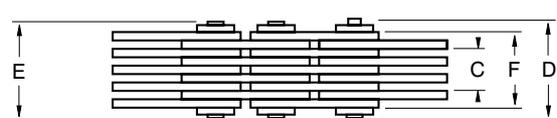
5/8" through 2" Pitch



Single
Outside
Guide
'SOG'



Double
Outside
Guide
'DOG'



Chain Dimensions - Outside Guide SC(RP) Chains

'SC' Chain Designation	Nominal Width Inches	Chain Pitch ins(mm)	Chain Ht. over Spkt. PCD A mm	Chain Height B mm	Width between Guide Links C mm	Width over Links F mm	Width over Rivet Pin D mm	Width over Drilled Pins E mm	Average U.T.S kN	Ave. Weight per Metre kg
R302DOG	1/2				8.0	14.3	16.3	17.8	17	0.7
R303DOG	3/4				14.4	20.6	22.6	24.0	25	1.0
R304DOG	1				20.7	27.0	29.0	30.5	33	1.3
R305DOG	1.1/4				27.1	33.4	35.3	36.8	42	1.6
R306DOG	1.1/2	3/8"	5.6	10.7	33.5	39.8	41.7	43.2	50	1.9
R307DOG	1.3/4	(9.525)			39.9	46.2	48.1	49.6	67	2.2
R308DOG	2				46.3	52.5	54.4	55.9	75	2.5
R310DOG	2.1/2				59.0	65.3	67.2	68.8	83	3.1
R312DOG	3				68.6	74.9	79.2	81.5	100	3.7
SC302	1/2				11.2	14.3	16.3	17.8	17	0.7
R303SOG	3/4				17.5	20.6	22.6	24.0	25	1.0
R304SOG	1				23.9	27.0	29.0	30.5	33	1.3
R305SOG	1.1/4	3/8"	5.6	10.7	30.3	33.4	35.3	36.8	42	1.6
R306SOG	1.1/2	(9.525)			36.7	39.8	41.7	43.2	50	1.9
R307SOG	1.3/4				43.1	46.2	48.1	49.6	67	2.2
R308SOG	2				49.4	52.5	54.4	55.9	75	2.5
R403DOG	3/4				14.4	20.6	23.8	25.4	33	1.3
R404DOG	1				20.7	27.0	30.0	32.0	44	1.7
R405DOG	1.1/4				27.1	33.4	36.3	38.1	56	2.1
R406DOG	1.1/2				33.5	39.8	42.7	44.5	67	2.5
R407DOG	1.3/4	1/2"	7.6	14.2	39.9	46.2	49.0	51.0	78	2.9
R408DOG	2	(12.70)			46.3	52.5	55.4	57.2	89	3.3
R410DOG	2.1/2				59.0	65.3	68.1	70.1	111	4.1
R412DOG	3				71.8	78.1	81.8	82.8	133	4.9
R414DOG	3.1/2				84.5	90.8	93.7	95.5	156	5.7
R416DOG	4				97.3	103.6	106.4	108.2	178	6.5
R403SOG	3/4				17.5	20.6	23.8	25.4	33	1.3
R404SOG	1				23.9	27.0	30.0	32.0	44	1.7
R405SOG	1.1/4	1/2"	7.6	14.2	30.3	33.4	36.3	38.1	56	2.1
R406SOG	1.1/2	(12.70)			36.7	39.8	42.7	44.5	67	2.5
R407SOG	1.3/4				43.1	46.2	49.0	51.0	78	2.9
R408SOG	2				49.4	52.5	55.4	57.2	89	3.3
R410SOG	2.1/2				62.2	65.3	68.1	70.1	111	4.1

Outside Guide SC Series Inverted Tooth Chains



Chain Dimensions - Outside Guide SC(RP) Chains

'SC' Chain Designation	Nominal Width Inches	Chain Pitch ins(mm)	Chain Ht. over Spkt. PCD A mm	Chain Height B mm	Width between Guide Links C mm	Width over Links F mm	Width over Rivet Pin D mm	Width over Drilled Pins E mm	Average U.T.S kN	Ave. Weight per Metre kg
R506DOG	1.1/2				31.1	39.2	45.3	47.4	83	3.5
R508DOG	2				43.5	51.7	58.4	59.8	111	4.6
R510DOG	2.1/2	5/8"	9.5	17.8	55.9	64.1	70.1	72.1	139	5.6
R512DOG	3	(15.88)			68.4	76.5	82.6	84.6	167	6.7
R514DOG	3.1/2				80.8	88.9	94.7	96.8	195	7.8
R516DOG	4				93.2	101.3	107.2	109.2	222	8.8
R504SOG	1				22.8	26.8	33.5	35.0	56	2.5
R506SOG	1.1/2				35.2	39.2	45.3	47.4	83	3.5
R508SOG	2				47.7	51.7	58.4	59.8	111	4.6
R510SOG	2.1/2	5/8"	9.5	17.8	60.1	64.1	70.1	72.1	139	5.6
R512SOG	3	(15.88)			72.5	76.5	82.6	84.6	167	6.7
R514SOG	3.1/2				84.9	88.9	94.7	96.8	195	7.8
R516SOG	4				97.3	101.3	107.2	109.2	222	8.8
R606DOG	1.1/2				31.1	39.2	46.2	48.3	100	4.2
R608DOG	2				43.5	51.7	58.4	60.5	133	5.5
R610DOG	2.1/2				55.9	64.1	71.1	73.2	167	6.8
R612DOG	3	3/4"	10.9	21.3	68.4	76.5	81.5	85.4	200	8.0
R614DOG	3.1/2	(19.05)			80.8	88.9	95.7	97.7	233	9.3
R616DOG	4				93.2	101.3	106.9	110.2	267	10.6
R620DOG	5				118.0	126.2	131.6	135.2	334	13.1
R624DOG	6				142.9	151.0	159.0	160.0	400	15.6
R606SOG	1.1/2				35.2	39.2	46.2	48.3	100	4.2
R608SOG	2				47.7	51.7	58.4	60.5	133	5.5
R610SOG	2.1/2				60.1	64.1	71.1	73.2	167	6.8
R612SOG	3	3/4"	10.9	21.3	72.5	76.5	81.5	85.4	200	8.0
R614SOG	3.1/2	(19.05)			84.9	88.9	95.7	97.7	233	9.3
R616SOG	4				97.3	101.3	106.9	110.2	267	10.6
R808DOG	2				34.9	47.4	57.4	60.2	178	6.5
R810DOG	2.1/2				47.6	60.1	69.7	72.5	222	8.0
R812DOG	3				60.3	72.8	81.0	85.1	267	9.6
R816DOG	4				85.7	98.2	107.4	110.2	356	12.7
R820DOG	5	1"	15.2	28.4	111.1	123.6	131.6	134.4	445	15.8
R824DOG	6	(25.40)			136.5	149.0	156.0	159.8	534	18.9
R832DOG	8				187.3	199.8	213.6	216.4	712	25.1
R808SOG	2				41.2	47.4	57.4	60.2	178	6.5
R810SOG	2.1/2				53.9	60.1	69.7	72.5	222	8.0
R812SOG	3	1"	15.2	28.4	66.6	72.8	81.0	85.1	267	9.6
R816SOG	4	(25.40)			92.0	98.2	107.4	110.2	356	12.7
R820SOG	5				117.4	123.6	131.6	134.4	445	15.8

For Installation and Lubrication information refer to HV data on page 78. For any further Technical information contact our Technical Sales Dept. at Birmingham.



Paddle wheel drive on a large riverboat



Standard Sprockets

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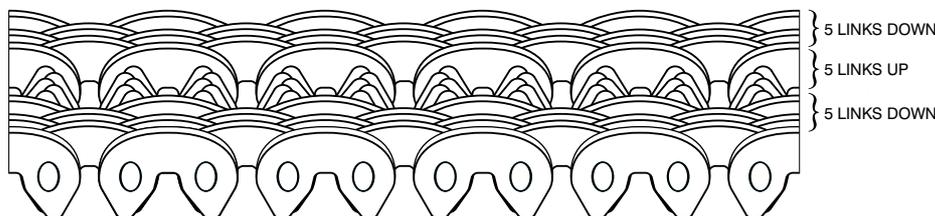
Duplex 'SC' and 'RP' Series Inverted Tooth Chains



Duplex Inverted Tooth Chain is designed for Serpentine Drives, where sprockets must be driven from both sides of the chain, and are for this reason often called Serpentine Chains. The Duplex Chains are available in two designs; the standard series type DUP using links and pins based on the earlier SC type chains, and having a flat back link form for running over guides; and the higher power capacity RPDUP type using current design SC links and pin assemblies. Power capacity of Duplex Chain is approx. 85% of equivalent size of 'SC' chain.

Duplex Chains provide the ideal alternative to Roller Chain where accurate smooth drive is required, such as extrusion of Plastic Film, or in processing of photographic film.

Standard construction chains are available in two basic Assemblies, either with two groups of links facing in one direction, with one in the opposite, or with three groups (rows) the opposite direction. Other assemblies can be provided to order.



Typical Duplex Chain Assembly - RPDUP404 - 5-5-5 Assembly

Note;

- 1/ Duplex Chain will not operate correctly on standard 'SC' Sprockets; and Sprockets should have minimum 21 teeth.
- 2/ Duplex Chain lengths must be an even number of pitches, as Offset Link Assemblies are not available for Duplex Chains.

Duplex - Serpentine - Double Sided drive - Inverted Tooth Chains

Chain Designation	Chain Pitch ins (mm)	Nominal Width Inches	Link Height B mm	Chain Assembly Type	Link Assembly	Width over Links F mm	Width over Rivet Pin D mm	Width over Drilled Pins E mm	Average U.T.S kN	Ave. Weight per Metre kg
RPDUP304	3/8" (9.525)	1	10.7	2x1	5-5-5	27.0	29.0	30.5	33	1.3
RPDUP305		1.1/4		3x2	4-3-3-3-4	33.4	35.3	36.8	42	1.6
RPDUP306(7)		1.1/2		2x1	8-7-8	39.8	41.7	43.2	50	1.9
RPDUP306(4)		1.1/2		3x2	5-4-4-4-5	41.4	43.3	44.8	50	2.0
RPDUP308		2		2x1	8-15-8	52.5	54.4	55.9	75	2.5
RPDUP312		3		2x1	12-23-12	78.1	80.0	81.5	100	3.7
RPDUP404	1/2" (12.70)	1	14.2	2x1	5-5-5	27.0	30.0	32.0	44	1.7
RPDUP406(7)		1.1/2		2x1	8-7-8	39.8	42.7	44.5	67	2.5
RPDUP406(4)		1.1/2		3x2	5-4-4-4-5	41.4	43.3	44.8	67	2.6
RPDUP408(9)		2		2x1	11-9-11	52.5	55.4	57.2	89	3.3
RPDUP408(15)		2		2x1	8-15-8	52.5	55.4	57.2	89	3.3
RPDUP409		2.1/4		3x2	7-6-6-6-7	58.9	61.8	63.6	100	4.1
RPDUP412		3		2x1	12-23-12	78.1	80.9	82.8	133	4.9
RPDUP416		4		2x1	22-19-22	103.6	106.4	108.2	178	6.5
RPDUP420		5		3x2	10-19-19-19-10	129.1	132.1	133.9	222	8.1
RPDUP606		3/4" (19.05)		1.1/2	21.3	2x1	6-5-6	39.2	46.2	48.3
RPDUP608	2		2x1	8-7-8		51.7	58.4	60.5	133	5.5
RPDUP610	2.1/2		2x1	8-13-8		64.1	71.1	73.2	167	6.8
RPDUP612	3		2x1	9-17-9		76.5	83.4	85.4	200	8.0
RPDUP616	4		2x1	12-23-12		101.3	108.2	110.2	267	10.6
RPDUP620	5		3x2	9-13-13-13-9		126.2	133.1	135.2	334	13.1
DUP304	3/8" (9.525)	1	9.5	2x1	4-5-4	23.4	25.9	27.4	18	1.0
DUP305		1.1/4		3x2	3-3-3-3-3	29.6	32.3	33.8	22	1.3
DUP306(7)		1.1/2		2x1	7-7-7	35.9	38.6	40.1	26	1.6
DUP306(4)		1.1/2		3x2	4-4-4-4-4	37.5	40.2	41.7	26	1.7
DUP308		2		2x1	7-15-7	48.4	51.3	52.8	35	2.1
DUP312		3		2x1	11-23-11	73.3	76.2	78.5	53	3.1
DUP404	1/2" (12.70)	1	11.9	2x1	4-5-4	23.8	26.9	28.7	23	1.3
DUP406(7)		1.1/2		2x1	7-7-7	36.5	39.6	41.4	35	2.1
DUP406(4)		1.1/2		3x2	4-4-4-4-4	38.1	41.2	43.0	35	2.2
DUP408(9)		2		2x1	10-9-10	48.9	52.3	54.1	47	2.7
DUP408(15)		2		2x1	7-15-7	50.5	53.9	55.7	47	2.8
DUP409		2.1/4		3x2	6-6-6-6-6	55.5	58.7	60.5	52	3.0
DUP412		3		2x1	11-23-11	74.5	78.0	79.8	70	4.0
DUP416		4		2x1	21-19-21	99.9	103.4	105.2	93	5.4
DUP420		5		3x2	9-19-19-19-9	125.2	129	130.8	117	6.7
DUP606		3/4" (19.05)		1.1/2	20.2	2x1	5-5-5	35.4	39.9	42.7
DUP608	2		2x1	7-7-7		47.8	52.1	55.4	70	4.5
DUP610	2.1/2		2x1	7-13-7		60.3	64.5	67.8	88	5.7
DUP612	3		2x1	8-17-8		72.8	77.2	80.5	105	6.7
DUP616	4		2x1	11-23-11		97.8	102.4	105.7	140	8.9
DUP620	5		3x2	8-13-13-13-8		122.7	127.5	130.8	175	11.2

Other Chain Widths and Link Grouping can be supplied to Special Order

Inverted Tooth Conveying Chains



Cross+Morse are proud to add to their extensive range of Inverted Tooth chains the Ramsey Conveying Chains. With nearly 50 years experience of supplying Conveying Chains to the Glass Industry, Ramsey have developed the best performing Conveying Chains, giving the end user optimum conveying efficiency combined with long service life, The Conveying Chains are used in the handling of Glass Bottles and Jars, Drinking Glasses, Car Headlights, and many other Glass products. It is also used for handling Glass Sheet, and in Inspection Lines

The Conveying Chains are available in four basic types of link form.

Standard Link - Introduced more than 30 years ago, has become the most commonly used chain in Glass Plants around the World. It uses a single oval pin, exclusive to Ramsey, providing trouble-free operation in most Glass production areas

UltraLife Link - An improved link form developed in conjunction with major glassware manufacturers for high production lines, to give increased service life. Enhanced production techniques enable Ramsey to produce links that are flat, and uniform with burr free straight edged apertures. The straight edge aperture maximises area of contact between pin and link so reducing joint bearing stress and wear.

Lo-Profile - The Lo-Profile Link has a reduced overall height with large flats on the link points to reduce loading on supporting wear plates, so reducing wear on the plates, and frictional drag.

Extended Pitch - Developed to reduce weight and effects of wear on long conveyors. Operates on standard 1/2" pitch sprockets. Link thickness was increased from 1.5mm to 2.3mm to improve rigidity.

Two types of Pin Assembly are available.

Single Pin - The single Oval Pin joint was specifically developed for the Glass Industry, in that the clearances it allows enables chains to run with little or no lubrication in high temperatures without seizure; and also is less effected by carbon build up than other types of joint. The single pin is also easier to install.

Pin and Rocker - The two pin joint as used in the latest transmission chains is available with the UltraLife links only. The two pin joint gives reduced friction, high efficiency and long life, but is only suitable for clean operating conditions where the chain can be lubricated, and as such is only suited to the cold end in glass production.

Two types of Link Assembly are available to provide best solution on differing applications.

All-Link Assembly(L) - The chain assembly consists entirely of links in the same manner as transmission chain. This provides the maximum surface area to support product, and is normally preferred where small products are involved. It has a high thermal mass and small inter-link air space, so creates resistance to induced heating or cooling.

Spacer Link Assembly(S) - With this assembly spacers approx. equal to the link thickness are placed between each link plate, to decrease weight, reduce surface area, and allow increased airflow through the chain. The greater interlink spaces also allow better passage of debris through the chain. For further improved airflow chains built with spacer bars can be provided to special order.

Chains are offered with three methods of guide.

Centre Guide(C) - As common with standard SC Transmission Chain a centre deep Guide Link engages with a groove in the sprockets to guide the chain over the Conveyor length.

Single Side Guide(S) - The outer links of the chain are full depth to guide the chain over simple sprockets. This enables simpler design of sprocket, and eliminates the groove in the sprocket which is a potential problem in dirty applications."

MultiSide Guide Assembly(M) - A number of the outer links are full depth to guide the chain over a narrower sprocket. This provides additional sideways strength for applications where the product is removed from the conveyor sideways. The additional deep links also provide increased area for chain support on a wear strip.

In addition to the standard chains shown in the following tables many special chains can be offered to suit the specific requirements of any application within the Glass Industry or elsewhere in conveying applications.

Ground Chain - This is a common modification done to provide an ultra smooth surface and even more accurate chain thickness control. Chain can be ground on the top surface 'GT', to provide better support for small glassware; ground the lower surface 'GB' to give a smoother operating surface; or ground on both 'GTB', for both improvements and an accurate link height (to 0.1 mm).

Chain Part Numbers: The Chain Part No. consists of four elements identifying Link type, Guide type, Assembly type, and Width. The last five characters of the number are the Assembly No., the prior letters the Chain Type, as per example:

Chain Type - Assembly No.

UL - C L 150

Chain Type		Nominal Width (in mm)
ST = Standard Link		
UL = UltraLife Single Pin	Guide Type	Build Type
UL2 = UltraLife Two Pin	C = Centre	L = All Link
LP = Low Profile	S = Side	S = Spacer Link
EP = Extended Pitch	M = MultiSide	

The example part number UL-CL150, is an Ultralife single pin, centre guide, all-link build Chain, of 150mm nominal width.

Tel +44 121 360 0155

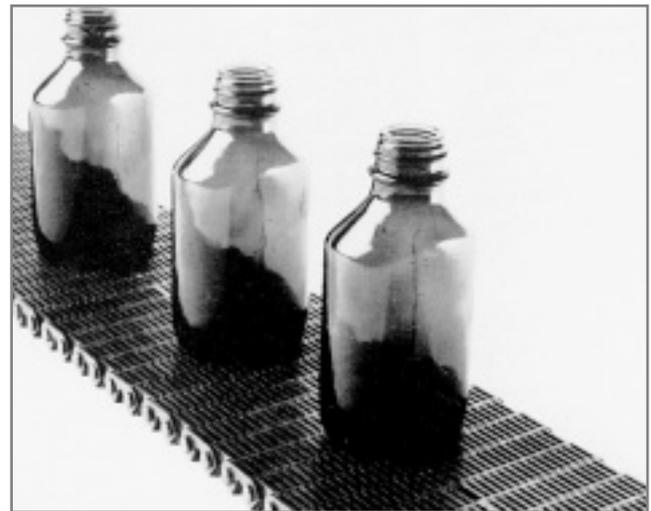
Fax +44 121 325 1079

Email sales@crossmorse.com

Inverted Tooth Conveying Chains



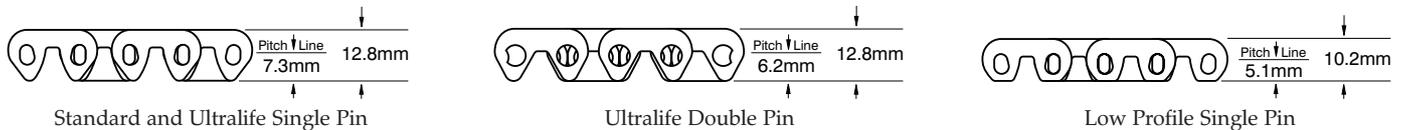
The Inverted Tooth form of this series of Conveyor Chains driving on the flank angle of the sprocket, reduces chordal effects giving a smoother transportation, coupled with improved timing and synchronisation. This enables faster production rates to be achieved. The smooth back of the chain provides the ideal conveying surface for all forms of glassware, automotive components, castings, timber and many more. Special attachments can be built into the chain where specialist conveying is required. The hardened links also exhibit high resistance to wear. Inverted Tooth Conveyor Chains can be operated either individually, in pairs or in multiple lanes for wide components. The Single Oval Pin design is particularly suited to bad environmental areas, requiring little or no lubrication, yet giving a long service life with minimal maintenance.



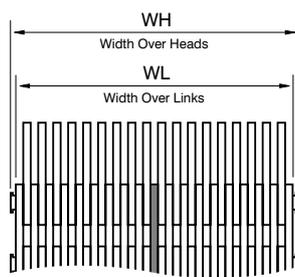
Centre Guide Chains

A popular assembly configuration of the chains is to use a Centre Guide Link. The Guide Links in the centre of the chain fit into a groove in the centre of the sprockets so keeping the chain aligned. The design has the advantage that the chain is supported over its full width on the sprocket and offers maximum contact between sprocket and chain to minimise wear on the chain/sprocket contact points. This feature is most beneficial on narrow width chains. Centre Guide Chains are available in Standard Single Pin, UltraLife Single and Rocker Pin design, and Lo-Profile Single Pin. In addition to the standard widths shown the chain can be provided to special order in any width from 15mm upwards. Stainless Steel Chains can also be supplied to special order for applications within a corrosive environment.

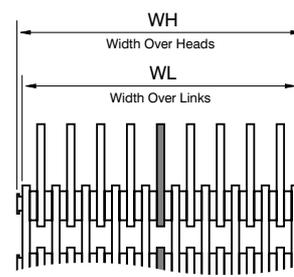
Chain Link Profiles



Chain Link Assemblies



All-Link Assembly



Spacer Link Assembly

Centre Guide Chain Dimensions

All-Link Assembly Part No.	Link-Spacer Assembly Part No.	Nominal Width mm	Width over Links WL max mm	Width over Rivet Pin 1 WH max mm	Sprocket Width max mm	Weight kg/m			
						All-Link Assembly		Link-Spacer Assembly	
						Single Pin	Two Pin*	Single Pin	Two Pin*
CL100	CS100	100	91	95	100	5.2	5.6	3.5	3.7
CL120	CS120	120	116	120	120	6.6	7.1	4.5	4.8
CL125	CS125	125	122	126	125	7.0	7.5	4.7	5.0
CL140	CS140	140	135	139	140	7.7	8.2	5.2	5.5
CL150	CS150	150	147	151	150	8.5	9.1	5.6	5.9
CL180	CS180	180	175	179	180	10.1	10.8	6.7	7.1
CL200	CS200	200	199	203	200	11.4	12.2	7.6	8.1
CL250	CS250	250	250	254	250	14.5	15.5	9.6	10.2
CL300	CS300	300	300	304	300	17.2	18.4	11.4	12.1

* Available in Ultralife only

Inverted Tooth Conveying Chains



Side Guide Chains

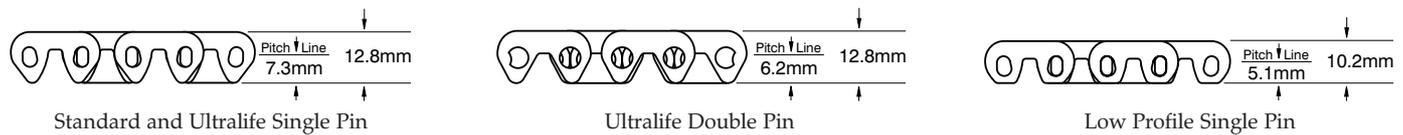
This assembly uses a single outer plate on each side of the chain to align the chain on the sprockets. It is the more popular configuration, using simpler, narrower sprockets than the centre guide.

Multiguide Chains

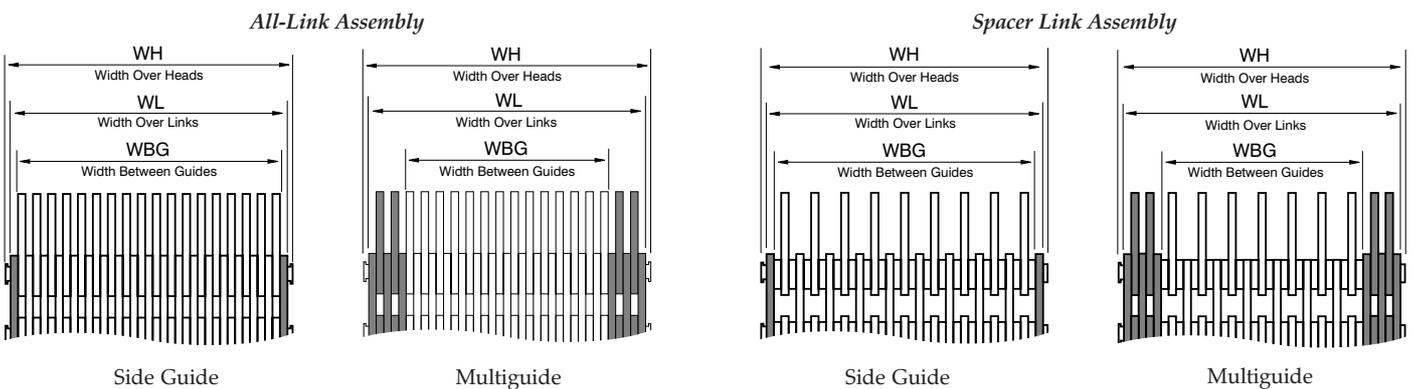
These chains have been designed for Stackers and Cross Conveyors, but are also used on other applications. Each side of the chain is built with a number of guide links from 15mm to 25mm wide. The extra guide links provide extra strength to resist bowing or twisting when the chain is subjected to constant side loads when product is pushed off sideways. The chain also offers a larger surface area to contact the support slide plates, reducing wear on both chain and support plate. Narrower Sprockets are used with these chains.

Both Side Guide and Multiguide Chains are available in Standard Single Pin, UltraLife Single and Rocker Pin design, and Lo-Profile Single Pin. In addition to standard chains special widths can be supplied to order; also chain can be supplied in Stainless Steel.

Chain Link Profiles



Chain Link Assemblies



Side Guide Chains

All-Link Assembly Part No.	Link-Spacer Assembly Part No.	Nominal Width mm	Width over Links WL min mm	Width over Rivet Pin 1 WH max mm	Width between Guides WBG min mm	Sprocket Width mm	Weight kg/m			
							All-Link Assembly		Link-Spacer Assembly	
							Single Pin	Two Pin*	Single Pin	Two Pin*
SL100	SS100	100	102.2	106	99.2	97.7	6.1	6.5	4.0	4.3
SL120	SS120	120	115.2	119	112.2	110.7	6.8	7.3	4.5	4.8
SL125	SS125	125	128.7	133	125.7	124.2	7.5	8.0	5.0	5.4
SL140	SS140	140	138.7	143	135.7	134.2	8.2	8.8	5.4	5.8
SL150	SS150	150	152.8	157	149.8	148.3	9.0	9.6	5.9	6.3
SL180	SS180	180	174.5	179	171.5	170.0	10.2	10.9	6.7	7.2
SL200	SS200	200	202.7	207	199.7	198.2	11.9	12.7	7.8	8.3
SL250	SS250	250	256.1	260	253.1	251.6	15.1	16.2	9.9	10.6
SL300	SS300	300	303.3	307	300.3	298.8	17.8	19.0	11.6	12.4

Multi-Guide Side Guide Chain

All-Link Assembly Part No.	Link-Spacer Assembly Part No.	Nominal Width mm	Width over Links WL min mm	Width over Rivet Pin 1 WH max mm	Width between Guides WBG min mm	Sprocket Width mm	Weight kg/m			
							All-Link Assembly		Link-Spacer Assembly	
							Single Pin	Two Pin*	Single Pin	Two Pin*
ML100	MS100	100	98.5	103	68.3	66.8	6.1	6.7	4.0	4.3
ML125	MS125	125	123.7	128	96.5	95.0	7.5	8.2	4.9	5.3
ML150	MS150	150	150.2	155	97.3	95.8	9.1	10.0	5.9	6.4
ML200	MS200	200	196.7	201	145.3	143.8	12.0	13.1	7.7	8.4
ML250	MS250	250	247.4	252	196.0	196.0	14.9	16.3	9.6	10.4
ML300	MS300	300	299.7	305	245.3	245.3	18.0	19.7	11.7	12.7

* Available in Ultralife only

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Inverted Tooth Conveying Chains



Extended Pitch Conveyor Chain

Ramsey Conveyor Chain is also available in 1" pitch. The chain is only available in the single pin configuration using the same pin as the standard pitch single pin chain. The longer pitch chain was developed to reduce chain weight, and increase air flow through the chain. The chain operates on standard 1/2" pitch sprockets. The plate thickness of the links has been increased from 1.5mm to 2.3mm to increase side strength and provide a more open weave chain. The resulting chain is as strong as the 1/2" pitch chain, but with fewer joints in its length has reduced wear and suffers less fouling from material ingress. Extended Pitch Chain is available in All link and Spacer Link design as centre and side guide assemblies. In addition to the standard widths shown special widths can be supplied to meet individual conveyor requirements.

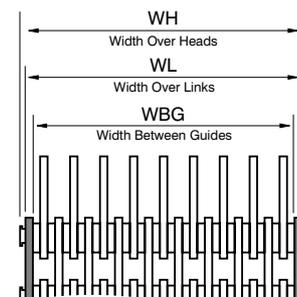
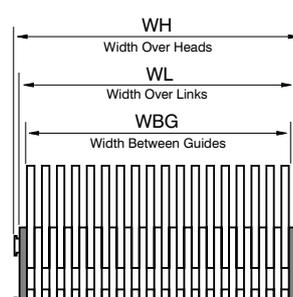
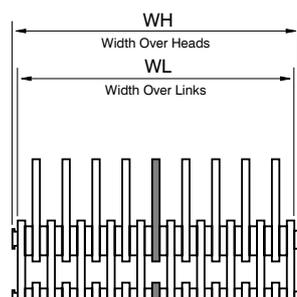
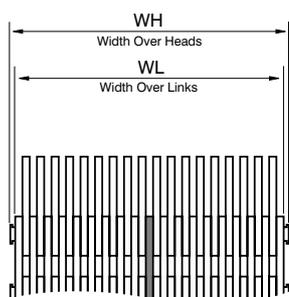
Chain Link Profiles



Chain Link Assemblies

Centre Guide

Side Guide



All-Link Assembly

Spacer Link Assembly

All-Link Assembly

Spacer Link Assembly

Extended Pitch (1 inch) Centre Guide Chain

All-Link Assembly Part No.	Link-Spacer Assembly	Nominal Width mm	Width over Links WL max mm	Width over Rivet Pin 1 WH max mm	Width between Guides	Sprocket Width mm	Weight kg/m	
							All-Link Assembly	Link-Spacer
EP-CL100	EP-CS100	100	92	95.7		100	3.3	2.4
EP-CL125	EP-CS125	125	123	126.6		125	4.4	3.2
EP-CL140	EP-CS140	140	134.9	138.5		140	4.8	3.5
EP-CL150	EP-CS150	150	146.8	150.4		150	5.2	3.8
EP-CL200	EP-CS200	200	196.1	199.3		200	7.1	5.1
EP-CL300	EP-CS300	300	300.6	304.3		300	10.7	7.6

Extended Pitch (1 inch) Side Guide Chain

All-Link Assembly Part No.	Link-Spacer Assembly	Nominal Width mm	Width over Links WL min mm	Width over Rivet Pin 1 WH max mm	Width between Guides	Sprocket Width mm	Weight kg/m	
							All-Link Assembly	Link-Spacer
EP-SL100	EP-SS100	100	102.2	106	99.2	97.7	3.8	2.5
EP-SL125	EP-SS125	125	128.7	133	125.7	124.2	4.7	3.2
EP-SL140	EP-SS140	140	138.7	143	135.7	134.2	5.1	3.3
EP-SL150		150	152.8	157	149.8	148.3	5.6	
	EP-SS150	150	149.7	154	146.7	145.2		4.0
EP-SL200	EP-SS200	200	196.9	202	194.5	193.0	7.1	4.9
EP-SL300	EP-SS300	300	303.3	307	300.3	298.8	11.0	7.2