



SELECTION

(a) Service Factor

From Table 1, determine the service factor which is applicable to the drive.

(b) Design Power

Multiply the normal running power by the service factor. This gives the Design Power which is used as the basis for selecting the drive.

(c) Chain Pitch

Refer to Table 2 (page 4) and trace to the right along the horizontal axis to the rev/min of the faster shaft. Trace upwards along the vertical axis to the Design Power. At the point of intersection, note the recommended chain pitch or pitches if there is an overlap.

(d) Speed Ratio

Divide the speed of the faster shaft by the speed of the slower shaft to obtain the speed ratio.

(e) Sprocket Sizes

Refer to Table 4 (page 6) and select driving and driven sprockets to match the Speed Ratio found in step (d). See sprocket pitch recommendations on page 4.

(f) Power Rating

Refer to the power rating tables (page 5) for the pitch of chain chosen in step (c). Read down the left hand column to the rotational speed of the faster shaft. On this line read the power rating for the simplex chain selected. These tables are for 19 tooth sprockets, if a sprocket with a different number of teeth is used, the power rating should be multiplied by the Sprocket Factor from the table at the bottom of page 5. If the power rating figure does not equal or preferably exceed the Design Power, calculated in step (b), either select a larger pitch or a multiple strand (duplex or triplex) chain. Single strand chain offers the most economical solution, and should be used where possible. However, for limitations in space, high speed or smooth running requirements a smaller pitch, duplex or triplex drive may be considered.

(g) Chain Length

To find the Chain length in pitches, use the formula below.

$$L = \frac{2C}{P} + \frac{T+t}{2} + \frac{KP}{C}$$

L = Length of chain in pitches.

C = Centre distance in mm.

P = Pitch of chain in mm.

T = Number of teeth on large sprocket.

t = Number of teeth on small sprocket.

K = Factor from Table 3 (page 6).

The calculated number of pitches should be rounded up to an even, whole number of pitches. If the centre distance cannot be adjusted, to allow for the use of an even number of pitches, it may be necessary to use an offset or cranked link, in which case the chain power rating will need to be reduced, consult your local Authorised Distributor. Re-calculate the exact centre distance required for the adjusted number of pitches. For recommended centre distance, refer to Table 5 below.

If a jockey or tensioning sprocket is used, add an extra 2 pitches.

To obtain the chain length, multiply the number of pitches by the pitch of the chain.

$$\text{Length of chain in feet} = \frac{LP}{305}$$

TABLE 1 – SERVICE FACTORS

TYPES OF DRIVEN MACHINE	TYPES OF PRIME MOVER					
	'Soft' starts			'Heavy' starts		
	Electric motors: A.C. – Star-delta start D.C. – Shunt wound Internal combustion engines with 4 or more cylinders. All prime movers fitted with centrifugal clutches, dry or fluid couplings.			Electric motors: A.C. – Direct-on-line start D.C. – Series and compound wound. Internal combustion engines with less than 4 cylinders.		
Hours per day duty						
	10 and under	Over 10 to 16	Over 16	10 and under	Over 10 to 16	Over 16
Light Duty Agitators (uniform density), Belt conveyors (uniformly loaded).	1.0	1.1	1.2	1.1	1.2	1.3
Medium Duty Agitators and mixers (variable density). Belt conveyors (not uniformly loaded), Kilns, Laundry machinery, Lineshafts, Machine tools, Printing machinery, Sawmill and woodworking machinery, Screens (rotary).	1.1	1.2	1.3	1.2	1.3	1.4
Heavy Duty Brick machinery, Bucket elevators, Conveyors (heavy duty), Hoists, Quarry plant, Rubber machinery, Screens (vibrating), Textile machinery.	1.3	1.4	1.5	1.5	1.6	1.7

EXAMPLE

Select a chain drive to transmit 1.5 kW from a gearbox running at 80 rev/min and driven by a direct-on-line electric motor, to a uniformly loaded conveyor drive shaft which is required to run at approximately 40 rev/min for 12 hours per day. Gearbox output shaft is 35mm and the conveyor headshaft is 65mm diameter.

(a) Service Factor

From Table 1 the Service Factor is 1.2.

(b) Design Power

= 1.5 x 1.2 = 1.8 kW.

(c) Chain Pitch

By referring to Table 2 (page 4), the intersection of design power and the rev/min of the faster shaft indicates a 16B 1" pitch chain.

(d) Speed Ratio

$$\frac{80}{40} = 2:1$$

(e) Sprocket Size

From Table 4 (page 6) sprockets of 19 and 38 teeth give a ratio of 2 : 1.

(f) Power Rating

The power ratings for 16B chain are given on page 5. The required power rating from step (b) is 1.8 kW. For a 19T driver sprocket, running at 80 rev/minute, the power rating for 16B-1 simplex chain is 3.79 kW. As this exceeds the required

design power the selection is satisfactory.

If space limitations demand smaller sprocket dimensions, alternative selections would be: use 12B-2 duplex chain which has a power rating of 2.11 kW at 80 rev/min or 15T driving to 30T on 16 B-1 1" simplex chain - power rating 0.8 x 3.79 = 3.03 kW

(g) Chain Length

Recommended centre distance for 16B-1 chain is 1000 mm (Table 5 below).

Therefore the chain length as per selection step (g) (chain length) is 108 pitches including a connecting link.

Drive Specification

108 pitches or 9 feet of Fenner 16B-1 chain 81-19 Driver Sprocket with a 2517 x 35mm bore 81-38 Driven Sprocket with a 3020 x 65mm bore

Alternative selection

Recommended centre distance for 12B-2 chain is 900 mm (Table 5 below).

Therefore the chain length as per selection step (g) (chain length) is 124 pitches including a connecting link.

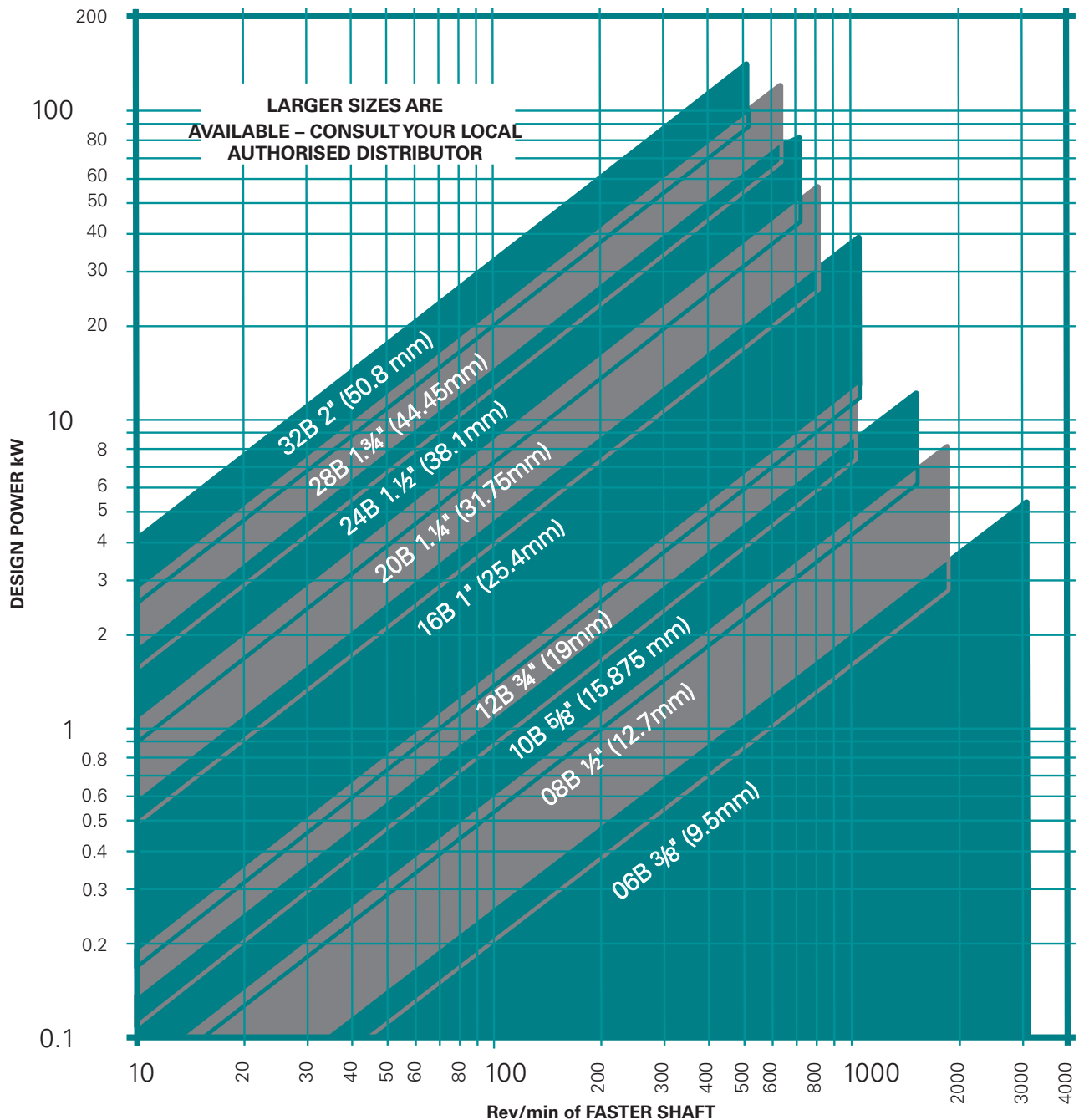
Alternative Drive Specification

124 pitches or 7.75 feet of Fenner 12B-2 chain 62-19 Driver Sprocket with a 2012 x 35mm bore 62-38 Driven Sprocket with a 3020 x 65mm bore.

TABLE 5 - RECOMMENDED CENTRE DISTANCE

Chain Pitch	Inches	3/8"	1/2"	5/8"	3/4"	1"	1.1/4"	1.1/2"	1.3/4"	2"
	mm	9.525	12.7	15.875	19.05	25.4	31.75	38.1	44.45	50.8
Centre Distance	mm	450	600	750	900	1000	1200	1350	1500	1700

TABLE 2 - BRITISH STANDARD CHAIN



GENERAL RECOMMENDATIONS ON SPROCKET SIZES

19 teeth and above —

Sprockets running at medium to maximum speeds on normal applications (see power ratings for speeds on page 5).

17 teeth —

Permissible to use this sprocket on very small pitches ie, 8mm and $\frac{3}{8}$ ". Refer to section above, but should be restricted to slow speed drives (see power ratings for speeds on page 5).

15 teeth or less —

Should be avoided unless shaft speed is below 100 revs/min.

23 teeth and above —

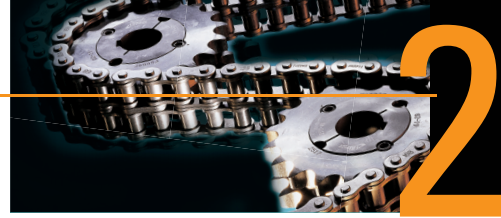
Recommended for impulse applications.

When ratios are low, the use of sprockets with high numbers of teeth minimises joint articulation, chain pull and bearing loads. If a small number of teeth are used on high speed, high load applications, hardening of teeth should be considered. Ratios over 7:1 are not recommended for single strand drives. In all drives where ratios exceed 5:1 the designer should consider using compound drives for maximum service life.

On drives where ratios exceed 3:1 the shaft centre distance should not be less than the sum of the sprocket pitch circle diameters.

For drives with vertical shafting always use multi-strand chains.

Roller Chain Drive Selection



POWER RATINGS (KW) FOR BRITISH STANDARD CHAIN BASED ON 19TOOTH DRIVER SPROCKETS

06B 3/8" (9.5mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
20	0.06	0.10	0.15	1
40	0.11	0.19	0.27	
60	0.16	0.27	0.40	
80	0.20	0.34	0.50	
100	0.25	0.43	0.62	
200	0.46	0.78	1.15	
400	0.86	1.46	2.15	2
600	1.24	2.11	3.10	
800	1.60	2.72	4.00	
1000	1.96	3.33	4.90	
1200	2.31	3.93	5.77	
1400	2.65	4.51	6.62	
1600	2.99	5.10	7.47	3
1800	3.33	5.66	8.32	
2000	3.66	6.22	9.15	
2200	3.99	6.78	9.97	
2400	4.31	7.33	10.77	
2600	4.63	7.87	11.57	
2800	4.95	8.42	12.37	
3000	5.27	8.96	13.17	

08B 1/2" (12.7mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	0.07	0.12	0.17	1
20	0.14	0.24	0.35	
30	0.20	0.34	0.50	
40	0.26	0.44	0.65	
50	0.31	0.53	0.77	
60	0.37	0.63	0.92	
70	0.42	0.71	1.05	2
80	0.48	0.82	1.20	
100	0.58	0.99	1.45	
200	1.09	1.85	2.72	
300	1.57	2.67	3.92	
400	2.03	3.45	5.07	
500	2.48	4.22	6.20	3
600	2.92	4.96	7.30	
800	3.78	6.43	9.45	
900	4.63	7.87	11.57	
1200	5.45	7.27	13.62	
1400	6.26	10.64	15.65	
1600	7.06	12.00	17.65	
1800	7.85	13.35	19.62	

10B 5/8" (15.875 mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	0.13	0.22	0.33	1
20	0.25	0.43	0.63	
30	0.36	0.61	0.89	
40	0.46	0.78	1.15	
50	0.57	0.96	1.40	
60	0.67	1.13	1.66	
70	0.76	1.29	1.90	2
80	0.86	1.47	2.15	
100	1.07	1.78	2.62	
200	1.96	3.33	4.90	
300	2.88	4.80	7.05	
400	3.65	6.21	9.13	
500	4.55	7.60	11.17	3
600	5.25	8.94	13.15	
800	6.81	11.58	17.03	
900	7.76	13.19	19.40	
1000	8.33	14.16	23.33	
1200	9.81	16.68	24.42	
1500	12.01	20.42	29.90	

12B 3/4" (19mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	0.19	0.32	0.48	1
20	0.36	0.61	0.90	
30	0.51	0.87	1.28	
40	0.66	1.12	1.65	
50	0.84	1.43	2.10	
60	0.96	1.63	2.40	
70	1.10	1.87	2.75	2
80	1.24	2.11	3.10	
90	1.38	2.35	3.45	
100	1.55	2.64	3.88	
200	2.90	4.93	7.25	
300	4.07	6.92	10.18	
400	5.27	8.96	13.18	3
500	6.62	11.25	16.55	
600	7.60	12.92	19.00	
700	8.95	15.22	22.38	
800	9.84	16.73	24.60	
900	11.26	19.14	28.15	
1000	12.03	20.45	35.08	
1200	14.55	24.74	36.38	

16B 1" (25.4mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
5	0.31	0.53	0.78	1
10	0.58	0.99	1.45	
20	1.09	1.85	2.73	
30	1.57	2.67	3.93	
40	2.03	3.45	5.08	
50	2.48	4.22	6.20	
60	2.92	4.96	7.30	2
70	3.36	5.71	8.40	
80	3.79	6.44	9.48	
90	4.21	7.16	10.53	
100	4.63	7.87	11.58	
200	8.64	14.69	21.60	
300	12.45	21.17	31.13	3
400	16.13	27.42	40.33	
500	19.72	33.52	49.30	
600	23.23	39.49	58.08	
700	26.69	45.37	66.73	
800	30.10	51.17	75.25	
900	33.46	56.88	83.65	
1000	36.79	62.54	91.98	

20B 1 1/4" (31.75mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	1.02	1.73	2.55	1
25	2.50	4.25	6.25	
50	4.65	7.90	11.63	
100	8.65	14.70	21.63	
150	12.40	21.08	31.00	
200	16.20	27.54	40.50	
250	19.73	33.54	49.33	2
300	23.27	39.56	58.18	
350	26.70	45.40	66.75	
400	30.20	51.34	75.50	
450	33.50	56.95	83.75	
500	36.92	62.76	92.30	
600	43.50	73.95	108.75	3
700	49.95	84.91	124.88	
800	55.50	94.35	138.75	

24B 1 1/2" (38.1mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	2.22	3.77	5.55	1
25	5.03	8.55	12.58	
50	9.40	15.98	23.50	
100	17.50	29.75	43.75	2
150	25.30	43.01	63.25	
200	32.70	55.59	81.75	
300	47.20	80.24	118.00	3
400	61.60	104.72	154.00	
500	74.60	126.82	186.50	
600	88.00	149.60	220.00	
700	94.00	159.80	235.00	

28B 1 3/4" (44.45mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	3.44	5.85	8.60	1
25	7.83	13.31	19.58	
50	14.32	24.34	35.80	
100	27.30	46.41	68.25	2
150	39.39	66.96	98.48	
200	51.10	86.87	127.75	
250	62.66	106.52	156.65	3
300	73.18	124.41	182.95	
350	84.30	143.31	210.75	
400	94.70	160.99	236.75	
450	105.90	180.03	264.75	
500	116.40	197.88	291.00	
600	133.50	226.95	333.75	

32B 2" (50.8mm) PITCH

Rev/min faster Shaft	19 Tooth			Type of Lubrication
	Simplex	Duplex	Triplex	
10	4.54	7.72	11.35	1
25	10.44	17.75	26.10	
50	19.40	32.98	48.50	
100	36.10	61.37	90.25	2
150	51.80	88.06	129.50	
200	67.30	114.41	168.25	
250	82.10	139.57	205.25	3
300	97.00	164.90	242.50	
350	112.00	190.40	280.00	
400	126.00	214.20	315.00	
500	154.00	261.80	385.00	

SPROCKET FACTOR

N°Teeth	11	13	15	17	19	21	23	25	27
Factor	0.5	0.65	0.8	0.9	1.0	1.1	1.2	1.3	1.4

For driver sprockets other than 19 tooth, multiply the power rating by the Sprocket Factor (above) to calculate the actual power rating.

For detail of lubrication types see page 30.

TABLE 3 – K FACTOR

T-t	K	T-t	K	T-t	K	T-t	K	T-t	K	T-t	K	T-t	K	T-t	K	T-t	K
1	0	11	3	21	11	31	24	41	43	51	66	61	94	71	128	81	166
2	0	12	4	22	12	32	26	42	45	52	68	62	97	72	131	82	170
3	0	13	4	23	13	33	28	43	47	53	71	63	101	73	135	83	175
4	0	14	5	24	15	34	29	44	49	54	74	64	104	74	139	84	179
5	1	15	6	25	16	35	31	45	51	55	77	65	107	75	142	85	183
6	1	16	6	26	17	36	33	46	54	56	79	66	110	76	146	86	187
7	1	17	7	27	18	37	35	47	56	57	82	67	114	77	150	87	192
8	2	18	8	28	20	38	37	48	58	58	85	68	117	78	154	88	196
9	2	19	9	29	21	39	39	49	61	59	88	69	121	79	158	89	201
10	3	20	10	30	23	40	41	50	63	60	91	70	124	80	162	90	205

TABLE 4 – SPEED RATIOS

		Number of teeth – Driving Sprocket																	
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27	30
Number of teeth – Driven Sprocket	10	1.00																	
	11	1.10	1.00																
	12	1.20	1.09	1.00															
	13	1.30	1.18	1.08	1.00														
	14	1.40	1.27	1.17	1.08	1.00													
	15	1.50	1.36	1.25	1.15	1.07	1.00												
	16	1.60	1.45	1.33	1.23	1.14	1.07	1.00											
	17	1.70	1.55	1.42	1.31	1.21	1.13	1.06	1.00										
	18	1.80	1.64	1.50	1.38	1.29	1.20	1.13	1.06	1.00									
	19	1.90	1.73	1.58	1.46	1.36	1.27	1.19	1.12	1.06	1.00								
	20	2.00	1.82	1.67	1.54	1.43	1.33	1.25	1.18	1.11	1.05	1.00							
	21	2.10	1.91	1.75	1.62	1.50	1.40	1.31	1.24	1.17	1.11	1.05	1.00						
	22	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	2.30	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	2.40	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	2.50	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	2.60	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		
	27	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	1.13	1.08	1.00	
	28	2.80	2.54	2.33	2.15	2.00	1.87	1.75	1.65	1.56	1.47	1.40	1.33	1.27	1.22	1.17	1.12	1.04	
	29	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	1.07	
30	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	1.11	1.00	
38	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	1.41	1.27	
57	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	2.38	2.28	2.11	1.90	
76	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	2.81	2.53	
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	3.52	3.17	

Ratios in BOLD type indicate ratios generally available in Taper Lock®

CHAIN LENGTH CONVERSION DATA

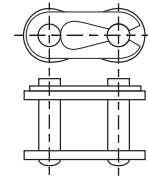
Chain Pitch (ins)	Pitches/ft	Pitches/Metre	Chain Pitch (ins)	Pitches/ft	Pitches/Metre
6mm	50.8	166.67	1"	12	39.37
8mm	38.1	125.00	1¼"	9.6	31.49
¼"	48	157.48	1½"	8	26.25
⅜"	32	104.99	1¾"	6.86	22.50
½"	24	78.74	2"	6	19.68
⅝"	19.2	62.99			
¾"	16	52.49			



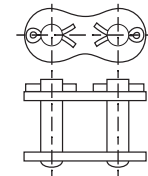
ROLLER CHAIN LINKS

CONN. LINK	CONN. LINK	RIVET PIN LINK	DOUBLE OFF-SET LINK	INNER LINK	OFFSET LINK
Spring Clip Type	Cotter Type	Rivet-on Type			
BRITISH STANDARD (BS)					
04B		04B	04B	04B	
05B		05B	05B	05B	
06B	06B	06B	06B	06B	06B
08B	08B	08B	08B	08B	08B
10B	10B	10B	10B	10B	10B
12B	12B	12B	12B	12B	12B
16B	16B	16B	16B	16B	16B
	20B	20B		20B	20B
	24B	24B		24B	24B
	28B	28B		28B	28B
	32B	32B		32B	32B
AMERICAN STANDARD (ASA)					
25		25	25	25	
35	35	35	35	35	35
40	40	40	40	40	40
41	41	41	41	41	41
50	50	50	50	50	50
60	60	60	60	60	60
80	80	80	80	80	80
	100	100		100	100
	120	120		120	120
	140	140		140	140
	160	160		180	160
ASA HEAVY DUTY					
40H		40H	40H	40H	
50H	50H	50H	50H	50H	50H
60H	60H	60H	60H	60H	60H
80H	80H	80H	80H	80H	80H
	100H	100H	100H	100H	100H
	120H	120H	120H	120H	120H
DOUBLE PITCH					
A2040	A2040	A2040		A2040	A2040
A2050	A2050	A2050		A2050	A2050
A2060	A2060	A2060		A2060	A2060
C2040	C2040	C2040		C2040	C2040
C2050	C2050	C2050		C2050	C2050
C2060/H	C2060/H	C2060/H		C2060/H	C2060/H
	C2080/H	C2080/H		C2080/H	
	C2100/H	C2100/H		C2100/H	
	C2120/H	C2120/H		C2120/H	
C2042	C2042	C2042		C2042	C2042
C2052	C2052	C2052		C2052	C2052
C2062/H	C2062/H	C2062/H		C2062/H	C2062/H
	C2082/H	C2082/H		C2082/H	
	C2102/H	C2102/H		C2102/H	
	C2122/H	C2122/H		C2122/H	

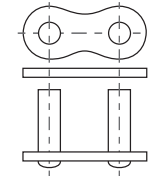
SPRING CLIP CONNECTING LINK



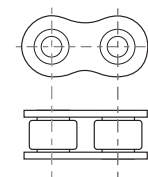
COTTER CONNECTING LINK



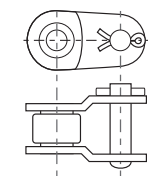
RIVET PIN LINK



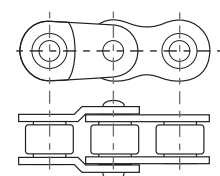
INNER LINK



OFFSET LINK



DOUBLE OFFSET LINK



ENDLESS - EVEN NO. OF LINKS



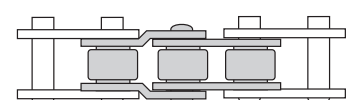
Odd number of links, with inner at each end and 1 standard connecting link.

ENDLESS - ODD NO. OF LINKS



Even number of links, with inner at one end and outer at other end plus 1 offset link.

ENDLESS - ODD NO. OF LINKS



Odd number of links, with outer at each end plus 1 double offset link.