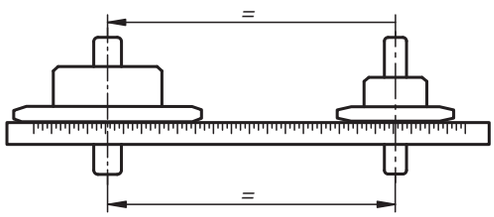
Technical information for roller chains

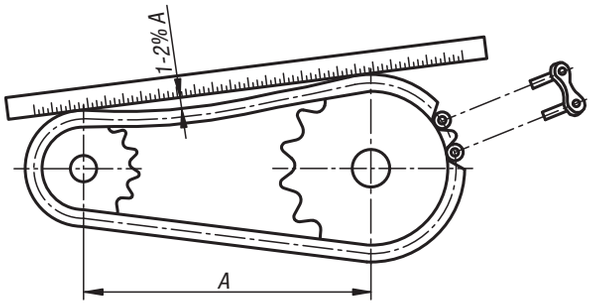
By steel link chains, roller chains have the greatest significance and the widest application possibilities. They are primarily used as drive chains but also as transport, conveyor and hoist chains. They offer positive and non-slip power transmission. As a result, constant transmission ratios are possible. The roller chains work without pre-tension. This means that bearings are only subjected to low loads. The direction of rotation always remains the same for a two sprocket chain drive. For a chain drive with more than two sprockets, economic solutions for the same or differing rotation directions can be easily solved. Chain speeds of 20 m/s and more are possible. With good lubrication, under normal operating conditions and at full load the efficiency of a chain drive is ca. 98% .

Mounting instructions:

The power to be transmitted, the speed of the smallest sprocket and the operating conditions must be known for correct chain selection. Where possible, sprockets with at least 17 teeth should be selected. At high speeds and high loads, the small sprocket should have at least 21 teeth and be hardened. The following numbers of teeth are recommended: 17, 19, 21, 23, 25, 38, 57, 76, 95 and 114. The distance between shafts can be freely selected. A value between 30 and 60 times the chain pitch is recommended. The chain should however have a wrap angle of at least 120° on the small sprocket. A ratio up to 4:1 per stage is usual for chain drives (a maximum of 7:1 should not be exceeded). The transmission ratio can be simply altered by exchanging the sprockets while maintaining the distance between the shafts.

The sprockets must be aligned and the shafts must be parallel. To ensure simple installation, place the connecting links on the sprocket. The chain slack should be between 1 and 2% of the shaft centre distance. The chains stretch while running due to wear; a method of tensioning the chain should be provided for this purpose. If the chains stretches too much (> 3%), the chain, and if necessary the sprockets should be replaced.

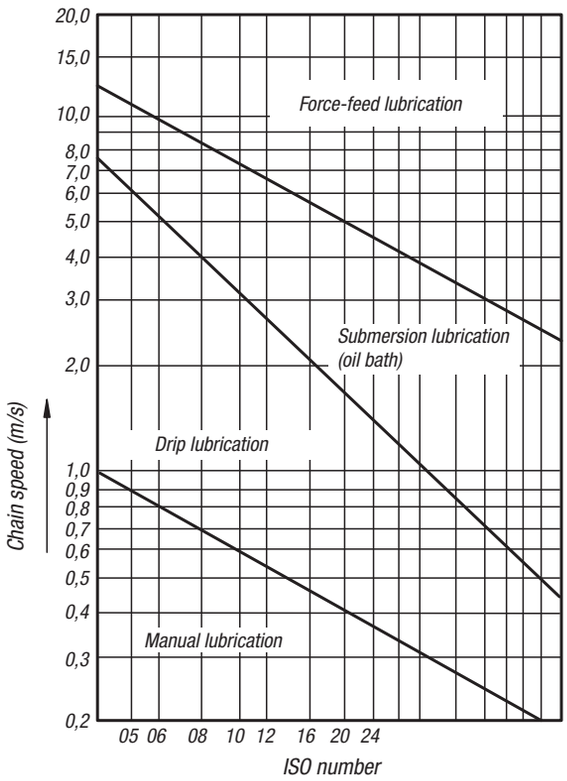




Maintenance and lubrication:

Regular maintenance of the chains is important in order to achieve a maximum service life. Our chains are supplied with corrosion protection and must be lubricated before commissioning. For a correctly dimensioned chain drive with suitable lubrication and maintenance, the service life is approx. 15,000 hours.

The type of lubrication is dependent on the power to be transmitted, the chain speed and the operating conditions. Highly viscous oil and greases are too thick to penetrate the chain and should be avoided. For roller chains, lubricants are used that are suitable for common lubricating methods such as manual lubrication, drip lubrication, submersion lubrication in an oil bath, force-feed lubrication or spray lubrication. Depending on the operating temperature, lubricating oils with SAE viscosity classes of between 30 and 50 should be used.



Ambient temperature:

-5°C to +25°C SAE 30
over +25°C to +45°C SAE 40
over +45°C to +65°C SAE 50

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Calculation of chain drives with 2 sprockets

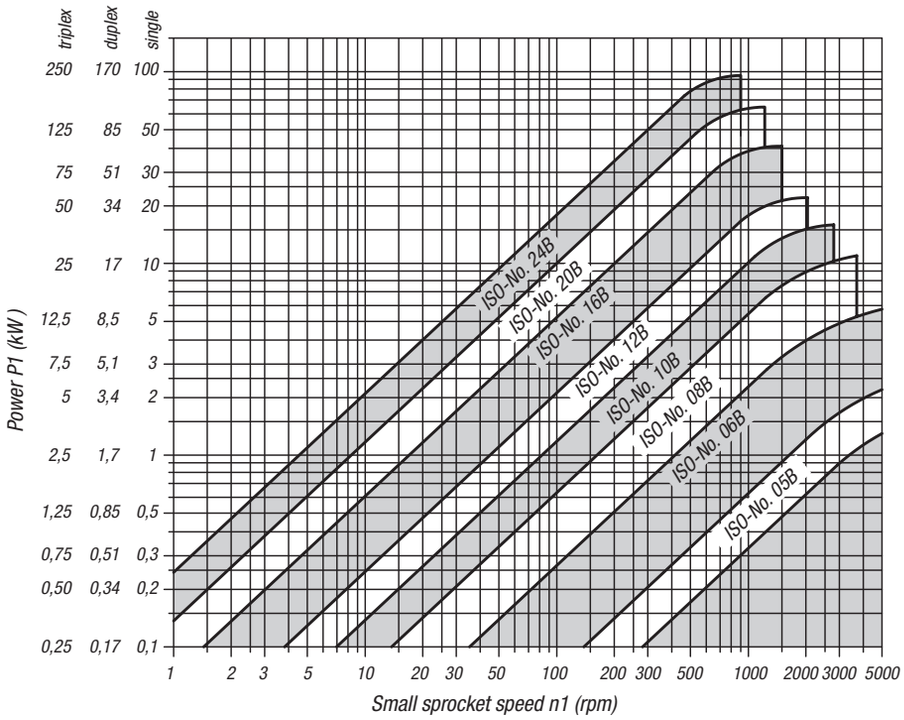
$P_1 = P_N * K_1 * K_2$

P_1 = corrected power (kW)
P_N = power to be transmitted (kW)
K_1 = factor for operating conditions

Running mode (examples)	Transmission ratio i = n1/n2 = z2/z1	Factor K1 for operating conditions No. of teeth on the small wheel z1							
		11	13	15	17	19	21	23	25
Drive without shocks and normal power Conveyors, generators, packaging machines, saws, centrifugal pumps, printing machines, escalators	1:1	*2,22	*1,85	1,59	1,39	1,22	1,10	0,99	0,91
	2:1	*1,97	1,64	1,41	1,23	1,08	0,97	0,88	0,80
	3:1	1,82	1,52	1,30	1,14	1,00	0,90	0,81	0,74
	5:1	1,68	1,40	1,20	1,05	0,92	0,83	0,75	0,68
Smooth drive with occasional slight shocks, normal to medium load Blowers, rotary dryers, continuous conveyors, cellulose machines, agitators for solids, bending machines, winches, weaving looms, knitting machines	1:1	*2,78	*2,32	1,98	1,74	1,53	1,38	1,24	1,13
	2:1	*2,46	*2,05	1,76	1,55	1,35	1,22	1,10	1,05
	3:1	*2,28	1,90	1,63	1,43	1,25	1,13	1,02	0,93
	5:1	2,10	1,75	1,50	1,31	1,15	1,04	0,93	0,85
Slight shocks, medium load Piston pumps, compressors, broaching machines, mills, mixing machines	1:1	*3,33	*2,79	2,38	2,09	1,83	1,65	1,49	1,36
	2:1	*2,95	*2,47	2,11	1,85	1,62	1,46	1,31	1,20
	3:1	*2,73	2,28	1,95	1,71	1,50	1,35	1,22	1,11
	5:1	*2,52	2,10	1,80	1,58	1,38	1,25	1,12	1,03
Moderate shocks, heavy pulsating load Planers, windlass, presses, compressors, mining machinery, stamping machines	1:1	*3,89	*3,25	*2,78	2,44	2,14	1,92	1,73	1,58
	2:1	*3,44	*2,87	2,46	2,16	1,89	1,70	1,53	1,40
	3:1	*3,19	*2,66	2,28	2,00	1,75	1,58	1,42	1,30
	5:1	*2,93	*2,45	2,09	1,84	1,16	1,45	1,31	1,19
Heavy shocks, alternating loads Excavators, crushers, calender rollers, pile drivers, brickwork machinery, hammer mills, construction machinery	1:1	*4,44	*3,71	*3,17	*2,78	2,44	2,20	1,98	1,81
	2:1	*3,93	*3,28	*2,81	2,46	2,16	1,95	1,75	1,60
	3:1	*3,64	*3,04	2,60	2,28	2,00	1,80	1,62	1,48
	5:1	*3,35	*2,80	2,39	2,10	1,84	1,66	1,49	1,36

** Conditions for preventing slack*

For electric motors and smooth-running drive units.
For combustion engines and other non-smooth running drive types the factor increases by 0.5.



Power diagram for DIN ISO 606 roller chains

For chain drives with 19 teeth, a chain length of 100 links, a ratio of 1:3 and a life expectancy of 15,000 operating hours.

The power diagram is not binding. It assumes operation under optimum conditions and is based on empirical values.