

Foreword

The formulation of this National Standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) under the project entitled "Enhancing the Implementation of AFMA Through Improved Agricultural Engineering Standards" which was funded by the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA).

This Standard was reviewed by the Technical Committee for Study 2 – Development of Standards for Engineering Materials and was circulated to various private and government agencies/organizations concerned for their comments and reactions. These standards were presented to the Philippine Society of Agricultural Engineers (PSAE) and subjected to a public hearing organized by the National Agriculture and Fisheries Council (NAFC). The comments and reactions received during the presentation and public hearing were taken into consideration in the finalization of the standards.

This Standard has been technically formulated in accordance with PNS 01:Part 4:1998 – Rules for the Structure and Drafting of Philippine National Standard. It provides specifications and proper application of drives using roller chains and sprockets and does not cover manufacturing specifications.

In the preparation of this standard, the following references were considered.

Baumeister, Theodore (ed.) 1997. Mark's handbook for mechanical engineers. 10th Edition. Mc Graw Hill Book Company, USA.

Carmichael, C. (ed.) 1950. Kent's Mechanical engineer's handbook. Design and production volume. 18th Edition. John Wiley and Sons, Inc., USA.

Horton, H. L. (Ed.) 1984. Machinery's handbook. 23rd Edition. Industrial press inc, New York.

ISO 606:1994, Short pitch transmission precision roller chains and chain wheels

Engineering Materials –Roller Chains and Sprockets for Agricultural Machines – Specifications and Applications

1 Scope

This Standard establishes specifications and provides technical information for the proper application roller chains and sprockets for drives in agricultural machinery.

2 Reference

The following normative references contains provisions which, through reference in this text, constitute provisions of this Standard:

PAES 304:2000, Engineering Materials – Keys and Keyways for Agricultural Machines – Specifications and Applications

3 Application

Roller chains are used to transmit power at high torque and low speed without slippage.

4 Definitions**4.1****chain pitch**

distance between adjacent joint members

4.2**pitch diameter**

the diameter of the pitch circle that passes through the centers of the link pins as the chain is wrapped on the sprocket

4.3**bottom diameter**

the diameter of a circle tangent to the curve (called the seating curve) at the bottom of the tooth gap

4.4**caliper diameter**

for a sprocket with an odd number of teeth, it is the distance from the bottom of the tooth gap to that of the nearest opposite tooth gap

NOTE:

The caliper diameter is the same as the bottom diameter for a sprocket with an even number of teeth.

4.5

outside diameter

it is the diameter over the tips of the teeth

5 Chains

5.1 Nomenclature

Figure 1 shows the type of chain according number of strands, either single strand or multiple-strand. Figure 2 shows the designation of dimensions of chains. Dimensions of chains are given in Table 1. Figure 3 shows the different types of links.

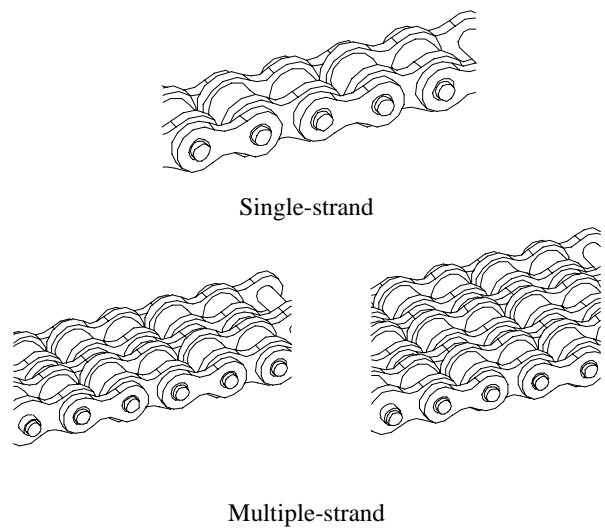


Figure 1 – Types of chains

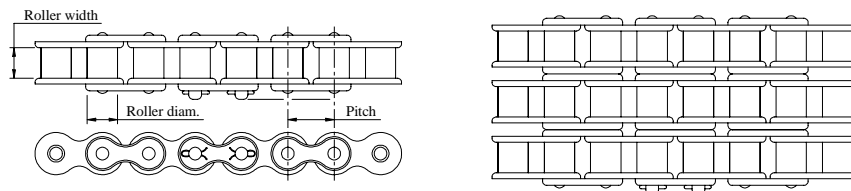
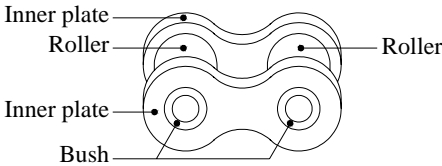
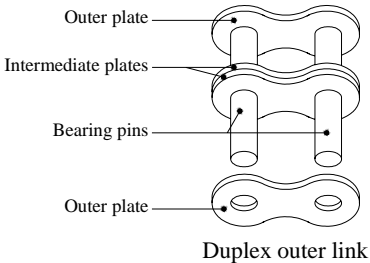
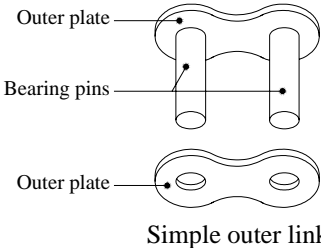


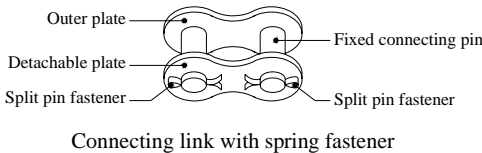
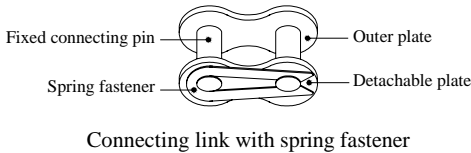
Figure 2 – Designation of dimensions of chains



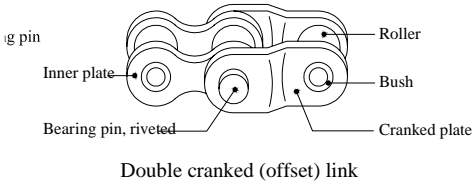
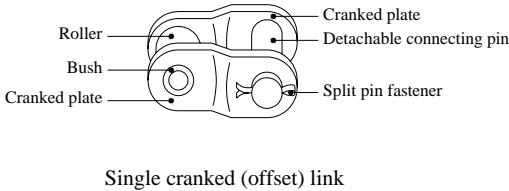
a) Inner link



b) Outer link for riveting



c) Outer links for riveting



d) Cranked (offset) links

Figure 3 – Types of links

Table 1 – Standard roller chain dimensions, mm

Standard chain number	Pitch, P	Max. roller diameter, D _r	Width, W	Pin diameter, D _p
25	6.35	3.30	3.18	2.30
35	9.53	5.08	4.76	3.58
41	12.70	7.77	6.35	3.58
40	12.70	7.92	7.94	3.96
50	15.88	10.16	9.53	5.08
60	19.05	11.91	12.70	5.94
80	25.40	15.88	15.88	7.92
100	31.75	19.05	19.05	9.53
120	38.10	22.23	25.40	11.10
140	44.45	25.40	25.40	12.70
160	50.80	28.58	31.75	14.27
180	57.15	35.71	35.71	17.45
200	63.50	39.67	38.10	19.84
240	76.20	47.63	47.63	23.80

NOTE:

- 1) The right-hand figure in the chain number is zero for roller chains of the usual proportions, 1 for a light-weight chain and 5 for a rollerless bushing chain. The numbers to the left -hand figure denotes the number of 1/8 inch (3.175 mm) in the pitch.
- 2) The letter *H* following the chain number denotes the heavy series. The hyphenated number 2 suffixed to the chain number denotes a double strand, 3 for triple strand, 4 for quadruple strand and so on. For agricultural purposes, only up to Chain number 120 is used.

5.1 Markings**5.2.1** The following information shall be marked on the chains:

- 1) Chain number designation.
- 2) Manufacturer's name and/or its trademark

5.2.2 The following information shall be marked on the packaging:

- 1) Chain number designation.
- 2) Manufacturer's name, trademark, and address.

6 Sprockets**6.1 Nomenclature**

Figure 4 shows the designation of dimensions of sprockets. Standard roller chain sprockets and their dimensions are given in Tables 2-9.

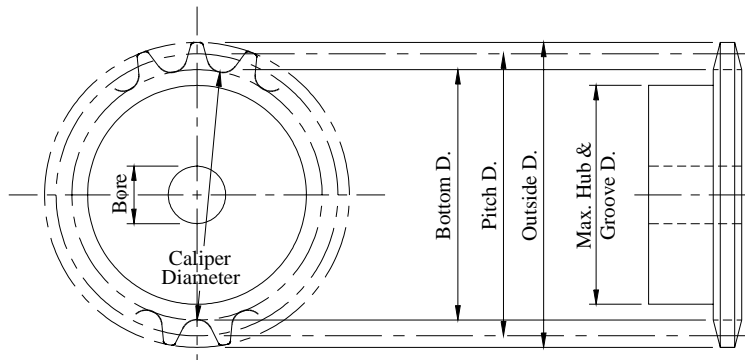


Figure 4 – Designation of dimensions of sprockets

Table 2 – Standard roller chain sprocket diameters for chain number 25, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	22.54	25.44	43	86.99	90.57	76	153.66	157.34
12	24.53	27.51	44	89.01	92.60	77	155.68	159.36
13	26.53	29.57	45	91.03	94.62	78	157.70	161.39
14	28.54	31.63	46	93.05	96.64	79	159.72	163.40
15	30.54	33.68	47	95.07	98.67	80	161.74	165.43
16	32.55	35.73	48	97.09	100.69	81	163.76	167.45
17	34.56	37.78	49	99.11	102.72	82	165.78	169.48
18	36.57	39.82	50	101.13	104.74	83	167.81	171.49
19	38.58	41.87	51	103.15	106.76	84	169.83	173.52
20	40.59	43.90	52	105.17	108.79	85	171.85	175.54
21	42.61	45.94	53	107.19	110.81	86	173.87	177.56
22	44.85	47.97	54	109.21	112.83	87	175.89	179.58
23	46.63	50.01	55	111.23	114.86	88	177.91	181.60
24	48.65	52.04	56	113.25	116.88	89	179.93	183.63
25	50.66	54.08	57	115.27	118.90	90	181.95	185.65
26	52.68	56.11	58	117.29	120.93	91	183.97	187.67
27	54.70	58.14	59	119.31	122.96	92	179.64	189.69
28	56.71	60.17	60	121.33	124.97	93	188.01	191.72
29	58.73	62.20	61	123.35	127.00	94	190.03	193.74
30	60.75	64.22	62	125.37	129.02	95	192.06	195.76
31	62.77	66.26	63	127.39	131.04	96	194.08	197.78
32	64.78	68.28	64	129.41	133.07	97	196.10	199.80
33	66.80	70.31	65	131.43	135.09	98	198.12	201.83
34	68.82	72.34	66	133.45	137.12	99	200.14	203.85
35	70.84	74.36	67	135.47	139.13	100	202.16	205.87
36	72.86	76.39	68	137.50	141.16	101	204.18	207.89
37	74.88	78.42	69	139.52	143.18	102	206.20	209.91
38	76.90	80.44	70	141.54	145.21	103	208.22	211.94
39	78.91	82.47	71	143.56	147.22	104	210.24	213.96
40	80.93	84.49	72	145.58	149.25	105	212.26	215.98
41	82.95	86.52	73	147.60	151.27	106	214.29	218.00
42	84.97	88.54	74	149.62	153.30	107	216.31	220.02
			75	151.64	155.31	108	218.33	222.05

Table 3 – Standard roller chain sprocket diameters for chain number 35, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	33.83	38.18	43	130.56	135.93	76	230.61	236.13
12	36.82	41.28	44	133.59	138.97	77	233.64	239.16
13	39.82	44.38	45	136.62	142.01	78	236.68	242.20
14	42.83	47.47	46	139.65	145.04	79	239.71	245.24
15	45.84	50.55	47	142.68	148.08	80	242.74	248.28
16	48.85	53.63	48	145.71	151.12	81	245.77	251.31
17	51.86	56.69	49	148.74	154.16	82	248.81	254.35
18	54.88	59.76	50	151.77	157.20	83	251.84	257.38
19	57.90	62.83	51	154.81	160.23	84	254.87	260.42
20	60.92	65.89	52	157.84	163.27	85	257.91	263.45
21	63.94	68.95	53	160.87	166.31	86	260.94	266.48
22	67.31	72.00	54	163.90	169.34	87	263.97	269.52
23	69.99	75.06	55	166.93	172.38	88	267.00	272.55
24	73.01	78.11	56	169.96	175.42	89	270.04	275.59
25	76.04	81.16	57	173.00	178.45	90	273.07	278.62
26	79.06	84.21	58	176.03	181.49	91	276.10	281.66
27	82.09	87.26	59	179.06	184.53	92	269.61	284.69
28	85.12	90.30	60	182.09	187.56	93	282.17	287.73
29	88.14	93.35	61	185.13	190.60	94	285.20	290.76
30	91.17	96.39	62	188.16	193.63	95	288.23	293.79
31	94.20	99.44	63	191.19	196.67	96	291.27	296.83
32	97.23	102.48	64	194.22	199.71	97	294.30	299.86
33	100.26	105.53	65	197.25	202.74	98	297.33	302.90
34	103.29	108.57	66	200.29	205.78	99	300.37	305.93
35	106.31	111.61	67	203.32	208.81	100	303.40	308.97
36	109.34	114.65	68	206.35	211.85	101	306.43	312.00
37	112.37	117.69	69	209.38	214.88	102	309.46	315.03
38	115.40	120.73	70	212.42	217.92	103	312.50	318.07
39	118.43	123.77	71	215.45	220.95	104	315.53	321.10
40	121.46	126.81	72	218.48	223.99	105	318.56	324.14
41	124.50	129.85	73	221.51	227.02	106	321.60	327.17
42	127.53	132.89	74	224.55	230.06	107	324.63	330.20
			75	227.58	233.09	108	327.66	333.25

Table 4 – Standard roller chain sprocket diameters for chain number 40 or 41, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	45.08	50.88	43	173.98	181.14	76	307.32	314.68
12	49.07	55.02	44	178.02	185.19	77	311.36	318.72
13	53.07	59.14	45	182.06	189.24	78	315.40	322.77
14	57.07	63.26	46	186.10	193.28	79	319.44	326.81
15	61.08	67.36	47	190.14	197.33	80	323.49	330.86
16	65.10	71.46	48	194.18	201.38	81	327.53	334.90
17	69.12	75.55	49	198.22	205.44	82	331.57	338.95
18	73.14	79.64	50	202.26	209.49	83	335.61	342.99
19	77.16	83.73	51	206.30	213.53	84	339.65	347.04
20	81.18	87.81	52	210.34	217.58	85	343.69	351.08
21	85.21	91.88	53	214.38	221.63	86	347.73	355.12
22	89.70	95.95	54	218.42	225.67	87	351.78	359.17
23	93.27	100.03	55	222.46	229.72	88	355.82	363.21
24	97.30	104.09	56	226.50	233.77	89	359.86	367.26
25	101.33	108.15	57	230.54	237.81	90	363.90	371.30
26	105.36	112.22	58	234.58	241.86	91	367.94	375.35
27	109.40	116.28	59	238.62	245.91	92	359.29	379.39
28	113.43	120.33	60	242.66	249.95	93	376.03	383.44
29	117.46	124.40	61	246.70	254.00	94	380.07	387.48
30	121.50	128.45	62	250.74	258.04	95	384.11	391.52
31	125.53	132.51	63	254.78	262.09	96	388.15	395.57
32	129.57	136.56	64	258.83	266.14	97	392.20	399.61
33	133.61	140.63	65	262.87	270.18	98	396.24	403.66
34	137.64	144.68	66	266.91	274.23	99	400.28	407.70
35	141.68	148.73	67	270.95	278.27	100	404.32	411.75
36	145.72	152.78	68	274.99	282.32	101	408.36	415.79
37	149.75	156.83	69	279.03	286.36	102	412.40	419.82
38	153.79	160.88	70	283.07	290.41	103	416.45	423.88
39	157.83	164.93	71	287.11	294.45	104	420.49	427.91
40	161.87	168.99	72	291.16	298.50	105	424.53	431.97
41	165.91	173.04	73	295.20	302.54	106	428.57	436.00
42	169.95	177.09	74	299.24	306.59	107	432.61	440.04
			75	303.28	310.63	108	436.66	444.09

Table 5 – Standard roller chain sprocket diameters for chain number 50, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	56.37	63.62	43	217.55	226.50	76	384.27	393.47
12	61.36	68.79	44	222.60	231.56	77	389.32	398.52
13	66.36	73.95	45	227.65	236.63	78	394.38	403.59
14	71.36	79.10	46	232.70	241.68	79	399.43	408.64
15	76.38	84.23	47	237.75	246.74	80	404.48	413.71
16	81.40	89.36	48	242.80	251.81	81	409.54	418.76
17	86.42	94.47	49	247.85	256.87	82	414.59	423.82
18	91.45	99.58	50	252.90	261.94	83	419.64	428.87
19	96.48	104.70	51	257.96	266.99	84	424.70	433.94
20	101.51	109.79	52	263.01	272.06	85	429.75	438.99
21	106.55	114.89	53	268.06	277.12	86	434.81	444.04
22	112.16	119.97	54	273.11	282.17	87	439.86	449.10
23	116.62	125.07	55	278.16	287.24	88	444.91	454.15
24	121.66	130.15	56	283.22	292.30	89	449.97	459.22
25	126.70	135.23	57	288.27	297.35	90	455.02	464.27
26	131.74	140.32	58	293.32	302.42	91	460.07	469.33
27	136.79	145.40	59	298.37	307.48	92	449.25	474.38
28	141.83	150.46	60	303.42	312.53	93	470.18	479.45
29	146.88	155.54	61	308.48	317.60	94	475.24	484.50
30	151.92	160.61	62	313.53	322.65	95	480.29	489.55
31	156.97	165.69	63	318.58	327.72	96	485.34	494.61
32	162.01	170.76	64	323.63	332.78	97	490.40	499.66
33	167.06	175.84	65	328.69	337.83	98	495.45	504.73
34	172.11	180.90	66	333.74	342.90	99	500.51	509.78
35	177.15	185.97	67	338.79	347.95	100	505.56	514.85
36	182.20	191.04	68	343.85	353.01	101	510.61	519.90
37	187.25	196.10	69	348.90	358.06	102	515.67	524.95
38	192.30	201.17	70	353.95	363.13	103	520.72	530.01
39	197.35	206.23	71	359.01	368.18	104	525.78	535.06
40	202.40	211.30	72	364.06	373.24	105	530.83	540.13
41	207.45	216.37	73	369.11	378.29	106	535.88	545.18
42	212.50	221.43	74	374.16	383.36	107	540.94	550.23
			75	379.22	388.41	108	545.99	555.29

Table 6 – Standard roller chain sprocket diameters for chain number 60, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	67.62	76.31	43	260.98	271.71	76	460.98	472.02
12	73.60	82.52	44	267.03	277.79	77	467.04	478.08
13	79.60	88.72	45	273.09	283.86	78	473.10	484.16
14	85.61	94.89	46	279.15	289.92	79	479.17	490.21
15	91.62	101.04	47	285.21	296.00	80	485.23	496.29
16	97.65	107.19	48	291.27	302.08	81	491.29	502.35
17	103.67	113.33	49	297.33	308.15	82	497.35	508.43
18	109.71	119.46	50	303.39	314.23	83	503.42	514.48
19	115.74	125.60	51	309.45	320.29	84	509.48	520.56
20	121.78	131.71	52	315.51	326.36	85	515.54	526.62
21	127.82	137.83	53	321.57	332.44	86	521.60	532.68
22	134.54	143.92	54	327.63	338.50	87	527.67	538.75
23	139.90	150.04	55	333.69	344.58	88	533.73	544.81
24	145.95	156.13	56	339.75	350.65	89	539.79	550.89
25	151.99	162.23	57	345.81	356.71	90	545.85	556.95
26	158.04	168.33	58	351.87	362.79	91	551.91	563.02
27	164.09	174.42	59	357.93	368.87	92	538.93	569.08
28	170.14	180.50	60	363.99	374.92	93	564.04	575.16
29	176.20	186.59	61	370.06	381.00	94	570.10	581.22
30	182.25	192.67	62	376.12	387.06	95	576.17	587.27
31	188.30	198.77	63	382.18	393.13	96	582.23	593.35
32	194.35	204.84	64	388.24	399.21	97	588.29	599.41
33	200.41	210.94	65	394.30	405.27	98	594.35	605.49
34	206.46	217.02	66	400.36	411.35	99	600.42	611.54
35	212.52	223.09	67	406.42	417.40	100	606.48	617.62
36	218.57	229.17	68	412.49	423.48	101	612.54	623.68
37	224.63	235.25	69	418.55	429.54	102	618.60	629.74
38	230.69	241.33	70	424.61	435.62	103	624.67	635.81
39	236.74	247.40	71	430.67	441.67	104	630.73	641.87
40	242.80	253.48	72	436.73	447.75	105	636.79	647.95
41	248.86	259.56	73	442.79	453.81	106	642.86	654.01
42	254.92	265.63	74	448.86	459.89	107	648.92	660.06
			75	454.92	465.94	108	654.98	666.14

Table 7 – Standard roller chain sprocket diameters for chain number 80, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	90.16	101.75	43	347.97	362.28	76	614.64	629.36
12	98.14	110.03	44	356.04	370.38	77	622.72	637.44
13	106.14	118.29	45	364.12	378.49	78	630.81	645.54
14	114.15	126.52	46	372.20	386.56	79	638.89	653.62
15	122.17	134.72	47	380.28	394.67	80	646.97	661.72
16	130.20	142.93	48	388.36	402.77	81	655.06	669.80
17	138.23	151.10	49	396.44	410.87	82	663.14	677.90
18	146.27	159.28	50	404.52	418.97	83	671.22	685.98
19	154.32	167.46	51	412.60	427.05	84	679.31	694.08
20	162.37	175.62	52	420.68	435.15	85	687.39	702.16
21	170.42	183.77	53	428.76	443.26	86	695.47	710.23
22	179.39	191.90	54	436.84	451.33	87	703.55	718.34
23	186.54	200.05	55	444.92	459.44	88	711.64	726.41
24	194.60	208.18	56	453.00	467.54	89	719.72	734.52
25	202.66	216.31	57	461.08	475.62	90	727.80	742.59
26	210.72	224.43	58	469.16	483.72	91	735.89	750.70
27	218.79	232.56	59	477.25	491.82	92	718.57	758.77
28	226.86	240.67	60	485.33	499.90	93	752.05	766.88
29	234.93	248.79	61	493.41	508.00	94	760.14	774.95
30	243.00	256.90	62	501.49	516.08	95	768.22	783.03
31	251.07	265.02	63	509.57	524.18	96	776.31	791.13
32	259.14	273.13	64	517.65	532.28	97	784.39	799.21
33	267.21	281.25	65	525.73	540.36	98	792.47	807.31
34	275.28	289.36	66	533.82	548.46	99	800.56	815.39
35	283.36	297.46	67	541.90	556.54	100	808.64	823.49
36	291.43	305.56	68	549.98	564.64	101	816.72	831.57
37	299.51	313.66	69	558.06	572.72	102	824.81	839.65
38	307.58	321.77	70	566.15	580.82	103	832.89	847.75
39	315.66	329.87	71	574.23	588.90	104	840.98	855.83
40	323.74	337.97	72	582.31	597.00	105	849.06	863.93
41	331.81	346.08	73	590.39	605.08	106	857.14	872.01
42	339.89	354.18	74	598.47	613.18	107	865.23	880.08
			75	606.56	621.26	108	873.31	888.19

Table 8 – Standard roller chain sprocket diameters for chain number 100, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
11	112.70	127.19	43	434.96	452.85	76	768.30	786.70
12	122.67	137.54	44	445.06	462.98	77	778.40	796.80
13	132.67	147.86	45	455.15	473.11	78	788.51	806.93
14	142.68	158.15	46	465.25	483.20	79	798.61	817.02
15	152.71	168.40	47	475.35	493.33	80	808.71	827.15
16	162.74	178.66	48	485.45	503.46	81	818.82	837.25
17	172.79	188.88	49	495.55	513.59	82	828.92	847.38
18	182.84	199.10	50	505.65	523.72	83	839.03	857.47
19	192.90	209.33	51	515.75	533.81	84	849.13	867.60
20	202.96	219.52	52	525.85	543.94	85	859.23	877.70
21	213.03	229.71	53	535.95	554.07	86	869.34	887.79
22	224.24	239.87	54	546.05	564.17	87	879.44	897.92
23	233.17	250.06	55	556.15	574.29	88	889.55	908.02
24	243.25	260.22	56	566.25	584.42	89	899.65	918.15
25	253.32	270.38	57	576.35	594.52	90	909.75	928.24
26	263.40	280.54	58	586.45	604.65	91	919.86	938.37
27	273.49	290.70	59	596.56	614.78	92	898.21	948.47
28	283.57	300.83	60	606.66	624.87	93	940.07	958.60
29	293.66	310.99	61	616.76	635.00	94	950.17	968.69
30	303.75	321.12	62	626.86	645.10	95	960.28	978.79
31	313.83	331.28	63	636.96	655.22	96	970.38	988.92
32	323.92	341.41	64	647.07	665.35	97	980.49	999.01
33	334.01	351.57	65	657.17	675.45	98	990.59	1,009.14
34	344.10	361.70	66	667.27	685.58	99	1,000.70	1,019.24
35	354.20	371.82	67	677.37	695.67	100	1,010.80	1,029.37
36	364.29	381.95	68	687.48	705.80	101	1,020.91	1,039.46
37	374.38	392.08	69	697.58	715.90	102	1,031.01	1,049.56
38	384.48	402.21	70	707.68	726.03	103	1,041.11	1,059.69
39	394.57	412.34	71	717.78	736.12	104	1,051.22	1,069.78
40	404.67	422.47	72	727.89	746.25	105	1,061.32	1,079.91
41	414.77	432.59	73	737.99	756.35	106	1,071.43	1,090.01
42	424.86	442.72	74	748.09	766.48	107	1,081.54	1,100.11
			75	758.20	776.57	108	1,091.64	1,110.23

Table 9 – Standard roller chain sprocket diameters for chain number 120, mm

No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
9	111.40	127.56	43	521.95	543.42	76	921.96	944.04
10	123.30	128.63	44	534.07	555.57	77	934.08	956.16
11	135.24	152.63	45	546.18	567.73	78	946.21	968.31
12	147.21	165.05	46	558.30	579.84	79	958.33	980.43
13	159.20	177.43	47	570.42	592.00	80	970.46	992.58
14	171.22	189.78	48	582.54	604.15	81	982.58	1,004.70
15	183.25	202.08	49	594.66	616.31	82	994.71	1,016.85
16	195.29	214.39	50	606.78	628.46	83	1,006.83	1,028.97
17	207.35	226.66	51	618.90	640.58	84	1,018.96	1,041.12
18	219.41	238.93	52	631.02	652.73	85	1,031.08	1,053.24
19	231.48	251.19	53	643.14	664.88	86	1,043.20	1,065.35
20	243.55	263.42	54	655.26	677.00	87	1,055.33	1,077.51
21	255.63	275.65	55	667.38	689.15	88	1,067.46	1,089.62
22	269.09	287.85	56	679.50	701.31	89	1,079.58	1,101.78
23	279.80	300.08	57	691.62	713.42	90	1,091.71	1,113.89
24	291.90	312.27	58	703.75	725.58	91	1,103.83	1,126.05
25	303.99	324.46	59	715.87	737.73	92	1,077.86	1,138.16
26	316.09	336.65	60	727.99	749.85	93	1,128.08	1,150.32
27	328.19	348.84	61	740.11	762.00	94	1,140.21	1,162.43
28	340.29	361.00	62	752.23	774.12	95	1,152.33	1,174.55
29	352.39	373.19	63	764.35	786.27	96	1,164.46	1,186.70
30	364.50	385.34	64	776.48	798.42	97	1,176.59	1,198.82
31	376.60	397.54	65	788.60	810.54	98	1,188.71	1,210.97
32	388.71	409.69	66	800.72	822.69	99	1,200.84	1,223.09
33	400.82	421.88	67	812.85	834.81	100	1,212.96	1,235.24
34	412.92	434.04	68	824.97	846.96	101	1,225.09	1,247.36
35	425.04	446.19	69	837.10	859.08	102	1,237.21	1,259.47
36	437.15	458.34	70	849.22	871.23	103	1,249.34	1,271.63
37	449.26	470.50	71	861.34	883.35	104	1,261.46	1,283.74
38	461.37	482.65	72	873.47	895.50	105	1,273.59	1,295.90
39	473.49	494.80	73	885.59	907.62	106	1,285.71	1,308.01
40	485.60	506.96	74	897.71	919.77	107	1,297.84	1,320.13
41	497.72	519.11	75	909.84	931.89	108	1,309.97	1,332.28
42	509.84	531.27						

6.2 Types

The following are the different designs or types of roller chain sprockets are shown by sectional views (Figure 5):

- 1) Type A - plain plate
- 2) Type B - has a hub on one side only
- 3) Type C - hub on both sides
- 4) Type D - detachable hub

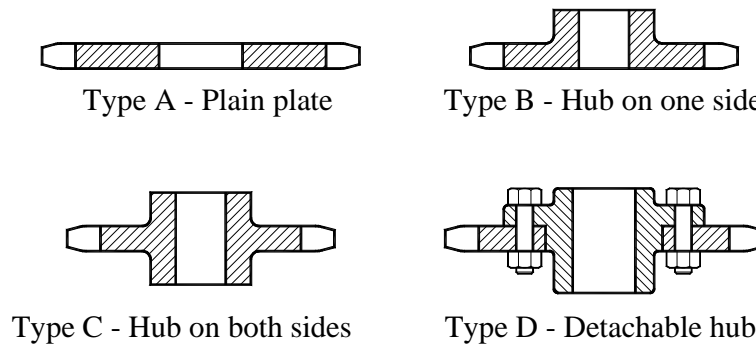


Figure 5 – Types of sprockets

6.3 Materials

For large sprockets, cast iron is commonly used, especially in drives with large speed ratios. Smaller sprockets are usually made of steel. The use of stainless steel or bronze are for corrosion resistance while Formica, nylon or other suitable plastic materials are for special conditions.

6.4 Markings

6.4.1 The following information shall be marked on the sprockets:

- 1) Type of sprocket
- 2) Number of teeth of the sprocket
- 3) Corresponding chain number designation.
- 4) Manufacturer's name and/or its trademark

6.4.2 The following information shall be marked on the packaging:

- 1) Type of sprocket
- 2) Number of teeth of the sprocket
- 3) Corresponding chain number designation.
- 4) Manufacturer's name, trademark, and address

7 Recommended design practices

7.1 Selection of chain and sprockets

7.1.1 The smallest applicable chain number is desirable for quiet operation and higher speed range allowable for chain drives. The power capacity varies with the chain pitch. However, short pitch with high working load can often be obtained by the use of multiple-strand chains.

7.1.2 The small sprocket selected must be large enough to accommodate the shaft. Table 9 gives the maximum bore and hub diameters consistent with commercial practice for sprockets with up to 25 teeth.

7.1.3 After selecting the small sprocket, the number of teeth in the large sprocket is determined by the desired ratio of the shaft speed. Over emphasis on the exactness of the speed ratio may result in cumbersome and expensive installation. In most cases, satisfactory operation can be obtained with a minor change in speed of one or both shafts.

Table 10 – Recommended roller chain sprocket maximum bore and hub dimensions

Chain number										
No. of teeth	35		41 or 40		50		60		80	
	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)
11	15.08	21.83	19.84	29.77	24.61	37.31	31.75	44.85	41.28	60.33
12	15.88	25.00	22.23	33.73	29.37	42.47	32.54	51.20	45.24	68.66
13	19.05	28.18	25.40	38.10	32.54	47.63	38.10	57.15	50.80	76.60
14	21.43	31.35	29.37	42.07	49.21	52.78	44.45	63.50	57.94	84.93
15	22.23	34.53	31.75	46.04	38.89	57.94	45.24	69.85	61.12	93.27
16	24.61	37.31	32.54	50.40	42.86	63.10	50.01	75.80	69.06	101.20
17	27.78	40.48	34.93	54.37	45.24	68.26	56.36	81.76	71.44	109.54
18	30.96	43.66	38.89	58.34	47.63	73.42	57.94	88.11	79.38	117.87
19	31.75	46.83	42.86	62.31	52.39	78.18	61.91	94.06	84.14	125.81
20	32.54	49.61	45.24	66.68	57.15	83.34	68.26	100.41	88.90	134.14
21	33.34	52.78	45.24	70.64	57.94	88.50	71.44	106.36	95.25	142.08
22	36.51	71.44	49.21	74.61	61.91	93.66	74.61	112.71	98.43	150.42
23	39.69	58.74	53.18	78.58	66.68	98.82	79.38	118.67	106.36	158.35
24	42.86	61.91	57.15	82.95	71.44	103.58	82.55	124.62	115.89	166.69
25	44.45	65.09	57.94	86.92	72.23	108.74	85.73	130.97	119.06	174.63
Chain number										
No. of teeth	100		120		140		160		180	
	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)	Max. bore, (mm)	Max hub dia. (mm)
11	50.01	75.41	58.74	90.88	71.44	105.97	83.34	121.44	100.01	152.00
12	57.94	85.73	69.85	103.19	82.55	120.65	104.78	137.72	119.86	172.64
13	64.29	96.04	77.79	115.49	90.49	134.94	103.19	154.38	129.38	193.28
14	68.26	106.36	85.73	127.79	98.43	149.23	119.06	170.66	145.26	213.92
15	78.58	116.68	95.25	140.10	112.71	163.91	123.83	187.33	158.75	234.16
16	83.34	127.00	101.60	152.40	119.06	178.20	139.70	203.60	177.80	254.79
17	92.87	137.32	113.51	164.70	128.59	192.48	13.92	219.87	188.91	275.43
18	96.04	147.24	118.27	177.01	142.88	206.77	158.75	236.54	203.20	295.67
19	106.36	157.56	125.41	189.31	144.46	221.06	174.63	252.81	228.60	315.91
20	116.68	167.88	138.11	201.61	158.75	235.35	177.80	269.08	247.65	336.55
21	119.06	177.80	144.46	213.92	173.04	249.63	196.85	285.35	254.00	356.79
22	123.83	188.12	149.23	225.82	184.15	263.92	212.73	301.63	276.23	377.03
23	134.94	198.44	161.93	238.13	188.91	277.81	228.60	317.90	295.28	397.67
24	144.46	208.36	173.04	250.43	203.20	292.10	244.48	337.29	3378.20	417.91
25	163.51	218.68	184.15	262.73	217.49	306.39	260.35	350.44	342.90	438.15

7.2 Center distance between sprockets

7.2.1 The center to center distance between sprockets, as a general rule, should not be less than 1.5 times the diameter of the larger sprocket and not less than thirty times the pitch nor more than 50 times the pitch. In certain cases, a center distance equivalent to 80 pitches may be considered an approved maximum. The chain should extend around at least 120 degrees of the pinion circumference, and this minimum amount of contact is obtained for all center distances provided the ratio is less than 3.5 to one.

7.2.2 Other things being equal, a longer center distance is recommended.

7.2.3 If possible, the center distance should be adjustable in order to take care of the slack due to elongation from wear and this range of adjustments should be at least one and one-half pitches.

7.2.4 A little slack is desirable as it allows the chain links to take the best position on the sprocket teeth and reduces the wear on the bearings. Too much sag or an excessive distance between the sprockets may cause the chain to whip up and down, a condition detrimental to smooth running and very destructive to the chain.

7.2.5 The sprockets should run in a vertical plane, the sprocket axes being approximately horizontal, unless an idler is used on the slack side to keep the chain in position. The most satisfactory results are obtained when the slack of the chain is on the bottom.

7.3 Center distance for a given length

When the distance between the driving and the driven sprockets can be varied to suit the length of the chain, this center distance for tight chain may be determined by the following formula:

$$C = \frac{P}{8} \left[2L_p - N - n + \sqrt{(2L - N - n)^2 - 0.810(N - n)^2} \right] \dots\dots\dots[\text{Eq. 1}]$$

Where: *C* = center to center distance in millimeters

L_p = the length of chain in pitches

P = pitch of the chain

N = the number of teeth in the large sprocket

n = number of teeth in small sprockets

NOTE:

The length *L* in pitches should be an even number for roller chain, so that the use of a cranked (offset) connecting link will not be necessary.

7.4 Length of driving chain

The total length of a roller chain should be given in multiples of twice the pitch, because the ends must be connected with an outside and inside link. The length of a chain can be calculated accurately enough for ordinary practice by the use of the following formula in which the variables used are defined in the previous equation:

$$L_p = 2C_p + \frac{N}{2} + \frac{n}{2} + \left(\frac{N-n}{2\pi}\right)^2 \left(\frac{I}{C_p}\right) \dots\dots\dots [\text{Eq. 2}]$$

Where: L_p = the length of chain in pitches
 C_p = the center to center distance in pitches

7.5 Idler sprockets

When sprockets have a fixed center distance or are non-adjustable, it may be advisable to use an idler sprocket for taking up the slack. The idler should preferably be placed against the slack side between the two strands of the chain. When an idler sprocket is applied to the tight side of the chain to reduce vibration, it should be on the lower side and so located that the chain will run on a straight line between the two main sprockets. An idler sprocket will wear excessively if the number of teeth is too small and the speed too high, because there is impact between the teeth and rollers even though the idler carries practically no load.

7.6 Power rating

7.6.1 The power rating of chains may be computed by the equation:

$$\text{Design power} = \frac{\text{Power to be transmitted} \times \text{Service factor}}{\text{Multiple strand factor}} \dots\dots\dots [\text{Eq. 3}]$$

The power rating, multiple strand factor, and service factors are given in Tables 10 - 17, 18, and 19, respectively. The tables for power rating are divided into four zones (as illustrated by the boundary lines), each zone corresponds to the type of lubrication.

Table 11 – Power ratings for standard single strand roller chain – No. 25, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																							
	50	100	300	500	700	900	1,200	1,500	1,800	2,100	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000
11	22	37	104	172	231	291	373	462	544	619	731	858	984	1,029	865	738	641	559	500	447	403	365	336	306
12	22	45	119	186	254	321	410	507	597	686	798	940	1,081	1,171	984	835	723	641	567	507	455	418	380	350
13	30	45	127	201	276	350	447	552	649	746	872	1,029	1,178	1,320	1,111	947	820	716	641	574	515	470	425	395
14	30	52	142	224	298	373	485	597	701	805	947	1,111	1,275	1,439	1,238	1,059	917	805	716	641	574	522	477	440
15	30	52	149	239	321	403	522	641	753	872	1,014	1,201	1,380	1,551	1,372	1,171	1,014	895	790	708	641	582	529	485
16	30	60	164	254	350	433	567	686	813	932	1,089	1,283	1,476	1,663	1,514	1,290	1,119	984	872	783	701	641	582	537
17	37	60	172	276	373	462	604	738	865	992	1,163	1,372	1,573	1,775	1,655	1,417	1,223	1,074	954	850	768	701	641	589
18	37	67	186	291	395	492	641	783	925	1,059	1,238	1,462	1,678	1,887	1,805	1,544	1,335	1,171	1,037	932	835	761	694	641
19	37	67	194	306	418	522	679	828	977	1,119	1,312	1,544	1,775	2,006	1,954	1,670	1,447	1,268	1,126	1,007	910	828	753	694
20	45	75	209	328	440	552	716	872	1,029	1,186	1,387	1,633	1,879	2,118	2,110	1,805	1,566	1,372	1,215	1,044	984	895	813	746
21	45	82	216	343	462	582	753	925	1,089	1,253	1,462	1,723	1,984	2,230	2,274	1,939	1,685	1,476	1,312	1,171	1,059	962	872	805
22	45	82	231	358	492	611	798	969	1,141	1,312	1,536	1,812	2,081	2,349	2,438	2,081	1,805	1,581	1,402	1,260	1,133	1,029	940	865
23	45	89	239	380	515	641	835	1,022	1,201	1,380	1,611	1,902	2,185	2,461	2,610	2,222	1,931	1,693	1,499	1,342	1,208	1,096	1,007	925
24	52	97	254	395	537	671	872	1,066	1,260	1,447	1,693	1,991	2,289	2,580	2,781	2,371	2,058	1,805	1,603	1,432	1,290	1,171	1,074	984
25	52	97	261	418	559	701	910	1,119	1,312	1,506	1,767	2,081	2,394	2,692	2,953	2,520	2,185	1,916	1,700	1,521	1,372	1,245	1,141	1,044
26	52	104	276	433	589	731	954	1,163	1,372	1,573	1,842	2,170	2,491	2,811	3,124	2,677	2,319	2,036	1,805	1,618	1,454	1,320	1,208	1,111
28	60	112	298	470	634	798	1,029	1,260	1,484	1,708	1,998	2,349	2,699	3,050	3,385	2,990	2,588	2,274	2,013	1,805	1,626	1,476	1,350	1,238
30	60	119	321	507	686	858	1,111	1,357	1,603	1,834	2,148	2,535	2,908	3,281	3,646	3,318	2,871	2,520	2,237	1,998	1,805	1,641	1,499	1,372
32	67	127	343	544	731	917	1,193	1,454	1,715	1,969	2,304	2,714	3,117	3,520	3,915	3,654	3,169	2,781	2,461	2,207	1,991	1,805	1,648	1,514
35	75	142	380	597	805	1,014	1,312	1,603	1,887	2,170	2,543	2,990	3,438	3,878	4,310	4,176	3,624	3,177	2,819	2,520	2,274	2,066	1,887	1,730
40	89	164	433	686	932	1,171	1,514	1,849	2,185	2,506	2,931	3,460	3,967	4,474	4,981	5,108	4,422	3,885	3,445	3,080	2,781	2,520	2,304	2,110
45	97	186	492	783	1,059	1,327	1,723	2,103	2,476	2,849	3,333	3,922	4,511	5,086	5,593	6,092	5,280	4,631	4,109	3,676	3,318	3,013	2,752	2,520
	A				B								C											

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 12 – Power ratings for standard single strand roller chain – No. 35, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																											
	50	100	300	500	700	900	1,200	1,500	1,800	2,100	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000	10,000			
11	75	134	365	574	783	977	1,268	1,551	1,827	2,103	2,461	2,192	1,737	1,424	1,193	1,022	880	776	686	611	552	500	462	425	358			
12	82	149	403	634	858	1,074	1,394	1,708	2,013	2,312	2,699	2,498	1,984	1,618	1,357	1,163	1,007	880	783	701	634	574	522	477	410			
13	89	164	440	694	940	1,171	1,521	1,857	2,192	2,520	2,946	2,811	2,237	1,827	1,529	1,305	1,133	992	880	790	708	649	589	544	462			
14	97	179	470	753	1,019	1,275	1,648	2,013	2,371	2,729	3,192	3,147	2,498	2,043	1,715	1,462	1,268	1,111	984	880	798	723	656	604	515			
15	104	186	507	805	1,096	1,372	1,775	2,170	2,558	2,938	3,438	3,490	2,767	2,267	1,902	1,618	1,402	1,230	1,096	977	880	798	731	671	574			
16	112	201	544	865	1,171	1,469	1,902	2,327	2,744	3,147	3,684	3,840	3,050	2,498	2,095	1,790	1,551	1,357	1,208	1,081	969	880	805	738	634			
17	119	216	582	925	1,253	1,566	2,036	2,483	2,931	3,363	3,937	4,206	3,341	2,737	2,259	1,954	1,693	1,491	1,320	1,178	1,066	969	880	813	694			
18	127	231	619	984	1,327	1,670	2,170	2,640	3,117	3,579	4,183	4,586	3,639	2,975	2,498	2,133	1,849	1,618	1,439	1,290	1,163	1,051	962	887	753			
19	134	246	656	1,044	1,409	1,767	2,289	2,804	3,303	3,796	4,437	4,974	3,945	3,229	2,707	2,312	2,006	1,760	1,559	1,394	1,260	1,141	1,044	954	820			
20	142	261	694	1,104	1,491	1,872	2,424	2,960	3,490	4,012	4,690	5,369	4,265	3,490	2,923	2,498	2,163	1,902	1,685	1,506	1,357	1,230	1,126	1,037	880			
21	149	276	731	1,163	1,573	1,969	2,550	3,124	3,676	4,228	4,944	5,779	4,586	3,751	3,147	2,685	2,327	2,043	1,812	1,618	1,462	1,327	1,208	1,111	947			
22	157	283	768	1,223	1,655	2,073	2,685	3,281	3,870	4,444	5,198	6,122	4,914	4,027	3,371	2,878	2,498	2,192	1,946	1,737	1,566	1,424	1,298	1,193	1,022			
23	164	298	805	1,283	1,737	2,177	2,819	3,445	4,057	4,661	5,451	6,428	5,257	4,303	3,602	3,080	2,670	2,341	2,081	1,857	1,678	1,521	1,387	1,275	1,089			
24	172	313	850	1,342	1,820	2,274	2,953	3,609	4,250	4,884	5,712	6,726	5,332	4,586	3,840	3,281	2,841	2,498	2,215	1,976	1,790	1,618	1,484	1,357	1,163			
25	179	328	887	1,402	1,902	2,379	3,080	3,766	4,437	5,101	5,966	7,032	5,958	4,877	4,086	3,490	2,274	2,655	2,356	2,103	1,902	1,723	1,573	1,447	1,230			
26	186	343	925	1,462	1,984	2,483	3,214	3,930	4,631	5,324	6,227	7,338	6,316	5,168	4,333	3,699	3,207	2,811	2,498	2,237	2,013	1,827	1,670	1,529	1,305			
28	201	373	999	1,581	2,148	2,692	3,482	4,258	5,019	5,764	6,749	7,979	7,062	5,779	4,840	4,139	3,587	3,147	2,789	2,498	2,252	2,043	1,864	1,715	1,387			
30	216	403	1,081	1,708	2,312	2,901	3,751	4,586	5,406	6,212	7,263	8,576	7,830	6,406	5,369	4,586	3,975	3,490	3,095	2,767	2,498	2,267	2,066	1,902	1,618			
32	231	433	1,156	1,827	2,476	3,110	4,027	4,922	5,794	6,659	7,755	9,172	8,650	7,062	5,913	5,048	4,377	3,840	3,408	3,050	2,752	2,498	2,282	2,095	-			
35	254	477	1,275	2,013	2,729	3,423	4,437	5,421	6,383	7,338	8,576	10,142	9,843	8,054	6,734	5,779	5,011	4,400	3,900	3,490	3,147	2,856	2,610	2,394	-			
40	291	544	1,469	2,327	3,154	3,952	5,123	6,264	7,375	8,501	9,918	11,707	12,080	9,843	8,277	7,062	6,122	5,369	4,765	4,265	3,840	3,490	-	-	-			
45	336	619	1,670	2,647	3,579	4,489	5,816	7,107	8,352	9,620	11,260	12,751	14,392	11,782	9,843	8,426	7,300	6,406	5,682	5,086	-	-	-	-	-			
	A		B						C																			

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 13 – Power ratings for standard single strand roller chain – No. 40, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																										
	10	25	50	100	200	300	400	500	700	900	1,000	1,200	1,400	1,600	1,800	2,100	2,400	2,700	3,000	3,500	4,000	5,000	6,000	7,000	8,000		
11	37	89	172	321	597	865	1,119	1,365	1,849	2,319	2,550	3,005	3,453	3,893	3,475	2,759	2,259	1,894	1,618	1,283	1,051	753	574	455	373		
12	45	104	186	350	656	947	1,230	1,499	2,036	2,550	2,804	3,303	3,796	4,280	3,960	3,147	2,573	2,155	1,842	1,462	1,193	858	649	515	425		
13	45	112	209	388	716	1,037	1,342	1,641	2,215	2,781	3,057	3,602	4,139	4,668	4,467	3,550	2,901	2,431	2,081	1,648	1,350	962	731	582	477		
14	52	119	224	418	776	1,119	1,454	1,775	2,401	3,013	3,311	3,900	4,482	5,056	4,996	3,960	3,244	2,722	2,319	1,842	1,506	1,081	820	649	529		
15	52	127	239	447	835	1,208	1,566	1,909	2,588	3,244	3,564	4,206	4,825	5,444	5,541	4,392	3,594	3,013	2,573	2,043	1,670	1,193	910	723	589		
16	60	142	261	485	895	1,298	1,678	2,051	2,774	3,475	3,825	4,504	5,175	5,839	6,100	4,840	3,960	3,318	2,834	2,252	1,842	1,320	999	798	649		
17	60	149	276	515	962	1,380	1,790	2,185	2,960	3,714	4,086	4,810	5,526	6,234	6,681	5,302	4,340	3,639	3,110	2,468	2,021	1,447	1,096	872	731		
18	67	157	291	544	1,022	1,469	1,902	2,327	3,147	3,952	4,340	5,116	5,876	6,629	7,278	5,779	4,728	3,960	3,385	2,685	2,200	1,573	1,193	947	-		
19	67	164	313	582	1,081	1,559	2,021	2,468	3,341	4,191	4,601	5,421	6,234	7,024	7,830	6,264	5,130	4,295	3,669	2,916	2,386	1,708	1,298	1,029	-		
20	75	179	328	611	1,141	1,648	2,133	2,610	3,527	4,429	4,869	5,734	6,585	7,427	8,277	6,763	5,541	4,638	3,960	3,147	2,573	1,842	1,402	1,111	-		
21	82	186	343	649	1,208	1,737	2,252	2,752	3,721	4,668	5,130	6,048	6,942	7,830	8,725	7,278	5,958	4,996	4,265	3,385	2,767	1,984	1,506	1,193	-		
22	82	194	365	679	1,268	1,827	2,364	2,893	3,915	4,907	5,391	6,353	7,300	8,203	9,172	7,830	6,391	5,354	4,571	3,632	2,968	2,125	1,618	1,283	-		
23	89	201	380	716	1,327	1,916	2,483	3,035	4,109	5,145	5,660	6,667	7,681	8,650	9,620	8,352	6,831	5,727	4,884	3,878	3,177	2,274	1,730	1,372	-		
24	97	216	403	746	1,394	2,006	2,595	3,177	4,295	5,391	5,928	6,980	8,054	9,023	10,067	8,874	7,278	6,100	5,212	4,131	3,385	2,424	1,842	1,462	-		
25	97	224	418	783	1,454	2,095	2,714	3,318	4,489	5,630	6,189	7,293	8,352	9,470	10,514	9,470	7,755	6,488	5,541	4,392	3,594	2,573	1,961	-	-		
26	104	231	433	813	1,521	2,185	2,834	3,460	4,683	5,876	6,458	7,606	8,725	9,843	10,962	10,067	8,203	6,883	5,876	4,661	3,818	2,729	2,081	-	-		
28	112	254	470	880	1,641	2,371	3,065	3,751	5,078	6,368	7,002	8,277	9,470	10,664	11,857	11,186	9,172	7,681	6,562	5,212	4,265	3,050	2,319	-	-		
30	119	276	507	947	1,775	2,550	3,303	4,042	5,466	6,860	7,532	8,874	10,216	11,484	12,826	12,453	10,142	8,501	7,278	5,779	4,728	3,385	2,573	-	-		
32	127	291	544	1,014	1,902	2,737	3,542	4,333	5,861	7,353	8,054	9,545	10,962	12,304	13,721	13,721	11,186	9,396	8,054	6,443	5,212	3,729	-	-	-		
35	142	321	604	1,119	2,095	3,013	3,907	4,772	6,458	8,128	8,874	10,514	12,080	13,572	15,138	15,660	12,826	10,738	9,172	7,278	5,958	4,265	-	-	-		
40	164	373	694	1,298	2,416	3,482	4,511	5,511	7,457	9,321	10,291	12,155	13,945	15,734	17,449	19,164	15,660	13,124	11,186	8,874	7,278	5,212	-	-	-		
45	186	425	790	1,469	2,744	3,952	5,123	6,264	8,501	10,589	11,707	13,795	15,809	17,822	19,836	22,744	18,717	15,660	13,348	10,589	8,725	-	-	-	-		
	A					B							C														

Type A: Manual or drip lubrication
 Type B: Bath or disc lubrication
 Type C: Oil or stream lubrication

Table 14 – Power ratings for standard single strand roller chain – No. 41, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																								
	10	25	50	100	200	300	400	500	700	900	1,000	1,200	1,400	1,600	1,800	2,100	2,500	2,700	3,000	3,500	4,000	5,000	6,000	7,000	8,000
11	22	52	97	179	328	403	611	753	1,022	1,275	1,402	1,275	1,014	828	694	552	455	380	321	254	209	149	112	89	75
12	22	52	104	194	365	522	679	828	1,119	1,402	1,544	1,454	1,156	947	790	626	515	433	365	291	239	172	127	104	82
13	30	60	112	209	395	567	738	902	1,215	1,529	1,678	1,641	1,305	1,066	895	708	582	485	418	328	268	194	149	119	97
14	30	67	119	231	425	619	798	977	1,320	1,655	1,820	1,834	1,454	1,193	999	790	649	544	462	365	298	216	164	127	104
15	30	67	134	246	462	664	858	1,051	1,424	1,715	1,961	2,036	1,618	1,320	1,111	880	716	604	515	418	336	239	179	142	119
16	30	75	142	268	492	708	925	1,126	1,529	1,916	2,103	2,245	1,782	1,454	1,223	969	790	664	559	447	365	261	201	157	127
17	37	82	164	283	529	761	984	1,201	1,626	2,043	2,245	2,453	1,946	1,596	1,335	1,059	865	731	619	492	403	291	216	172	142
18	37	89	164	298	559	805	1,044	1,283	1,730	2,170	2,386	2,677	2,125	1,737	1,454	1,156	947	790	679	537	440	313	239	186	-
19	37	89	172	321	597	858	1,111	1,357	1,834	2,304	2,535	2,901	2,304	1,887	1,581	1,215	1,029	858	694	582	477	336	261	209	-
20	45	97	179	336	626	902	1,171	1,432	2,088	2,431	2,677	3,132	2,483	2,036	1,708	1,350	1,111	925	790	626	515	365	283	224	-
21	45	104	194	358	664	954	1,238	1,514	2,043	2,565	2,819	3,326	2,677	2,192	1,834	1,454	1,193	999	850	679	552	395	298	239	-
22	45	104	201	373	694	1,007	1,298	1,588	2,155	2,699	2,968	3,497	2,871	2,349	1,969	1,559	1,275	1,074	917	723	597	425	321	254	-
23	45	112	209	395	731	1,051	1,365	1,670	2,259	2,834	3,110	3,669	3,065	2,513	2,103	1,670	1,365	1,148	977	776	634	455	343	276	-
24	52	119	216	410	768	1,104	1,432	1,745	2,364	2,960	3,259	3,840	3,266	2,677	2,245	1,782	1,454	1,223	1,104	828	679	485	365	291	-
25	52	127	231	425	798	1,156	1,491	1,827	2,468	3,095	3,408	4,012	3,475	2,841	2,386	1,894	1,514	1,298	1,111	880	708	515	395	-	-
26	52	127	239	447	835	1,201	1,559	1,902	2,580	3,229	3,550	4,183	3,684	3,020	2,528	2,006	1,641	1,380	1,178	932	761	544	418	-	-
28	60	142	261	485	902	1,305	1,685	2,066	2,789	3,497	3,848	4,534	4,116	3,371	2,826	2,245	1,834	1,536	1,305	1,044	850	611	462	-	-
30	60	149	283	522	977	1,402	1,820	2,222	3,005	3,773	4,146	4,884	4,571	3,736	3,132	2,483	2,036	1,708	1,380	1,156	947	679	515	-	-
32	67	164	298	559	1,044	1,506	1,946	2,386	3,229	4,042	4,444	5,242	5,033	4,116	3,453	2,737	2,245	1,879	1,603	1,275	1,044	746	-	-	-
35	75	179	328	619	1,148	1,655	2,148	2,625	3,550	4,452	4,899	5,772	5,757	4,713	3,945	3,132	2,565	2,148	1,834	1,454	1,193	850	-	-	-
40	89	201	380	716	1,327	1,916	2,483	3,035	4,101	5,145	5,660	6,667	7,032	5,757	4,825	3,825	3,132	2,625	2,245	2,006	1,454	1,044	-	-	-
45	104	231	433	805	1,506	2,177	2,819	3,273	4,661	5,846	6,428	7,606	8,426	6,868	5,757	4,571	3,736	3,132	2,677	2,125	1,737	-	-	-	-
	A				B								C												

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 15 – Power ratings for standard single strand roller chain – No. 50, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																									
	10	25	50	100	200	300	400	500	700	900	1,000	1,200	1,400	1,600	1,800	2,100	2,400	2,700	3,000	3,500	4,000	4,500	5000	5,500	6,000	
11	82	179	336	626	1,163	1,678	2,177	2,662	3,602	4,519	4,966	5,854	6,063	4,959	4,161	3,296	2,699	2,267	1,931	1,536	1,253	1,051	895	776	686	
12	89	194	365	686	1,283	1,842	2,394	2,923	3,960	4,959	5,451	6,428	6,905	5,652	4,735	3,758	3,080	2,580	2,200	1,745	1,432	1,201	1,022	887	776	
13	97	216	403	746	1,394	2,013	2,610	3,184	4,310	5,406	5,943	7,010	7,755	6,376	5,339	4,243	3,468	2,908	2,483	1,969	1,611	1,350	1,156	999	-	
14	104	231	433	813	1,514	2,177	2,826	3,453	4,676	5,861	6,592	7,606	8,725	7,121	5,973	4,735	3,878	3,251	2,774	2,200	1,805	1,514	1,290	1,119	-	
15	112	254	470	872	1,633	2,349	3,042	3,721	5,033	6,316	6,942	8,203	9,545	7,904	6,622	5,257	4,303	3,602	3,080	2,438	1,998	1,678	1,432	1,238	-	
16	119	268	500	940	1,745	2,506	3,259	3,989	5,399	6,771	7,442	8,799	10,067	8,725	7,278	5,787	4,735	3,967	3,393	2,692	1,902	1,842	1,573	1,365	-	
17	127	291	537	999	1,864	2,692	3,482	4,258	5,764	7,226	7,979	9,396	10,738	9,545	7,979	6,338	5,190	4,347	3,714	2,946	2,409	2,021	1,723	1,499	-	
18	134	306	567	1,066	1,984	2,856	3,706	4,526	6,130	7,681	8,426	9,992	11,409	10,365	8,725	6,920	5,652	4,735	4,042	3,207	2,625	2,200	1,879	-	-	
19	142	321	604	1,126	2,103	3,035	3,930	4,802	6,503	8,128	8,948	10,589	12,155	11,260	9,470	7,457	6,130	5,138	4,385	3,482	2,849	2,386	2,036	-	-	
20	149	343	641	1,193	2,222	3,207	4,154	5,071	6,868	8,576	9,470	11,186	12,826	12,155	10,216	8,054	6,622	5,324	4,735	3,758	3,080	2,580	2,200	-	-	
21	157	358	671	1,260	2,341	3,378	4,377	5,347	7,241	9,098	9,992	11,782	13,497	13,124	10,962	8,725	7,121	5,973	5,101	4,042	3,311	2,774	2,371	-	-	
22	164	380	708	1,320	2,468	3,550	4,601	5,623	7,606	9,545	10,514	12,379	14,243	14,019	11,782	9,321	7,606	6,406	5,466	4,340	3,550	2,975	2,543	-	-	
23	172	395	746	1,387	2,588	3,729	4,825	5,898	7,979	9,992	11,036	12,975	14,914	14,989	12,602	9,992	8,203	6,846	5,846	4,638	3,796	3,184	-	-	-	
24	186	418	776	1,454	2,707	3,900	5,056	6,182	8,352	10,514	11,558	13,572	15,585	15,958	13,423	10,664	8,725	7,293	6,450	4,944	4,042	3,393	-	-	-	
25	194	433	813	1,514	2,834	4,079	5,280	6,458	8,725	10,962	12,080	14,168	16,331	17,002	14,243	11,335	9,247	7,755	6,622	5,257	4,303	3,602	-	-	-	
26	201	455	850	1,581	2,953	4,250	5,511	6,734	9,098	11,409	12,602	14,839	17,002	18,046	15,138	12,006	9,843	8,203	7,024	5,570	4,564	3,825	-	-	-	
28	216	492	917	1,715	3,199	4,608	5,973	7,300	9,843	12,379	13,646	16,033	18,419	20,134	16,853	13,423	10,962	9,172	7,830	6,227	5,101	4,273	-	-	-	
30	231	529	992	1,857	3,3273	4,966	6,435	7,830	10,664	13,348	14,690	17,300	19,836	22,371	18,717	14,839	12,155	10,216	8,725	6,905	5,652	-	-	-	-	
32	246	567	1,059	1,984	3,699	5,324	6,898	8,426	11,409	14,317	15,734	18,568	21,327	24,012	20,656	16,405	13,423	11,260	9,620	7,606	6,227	-	-	-	-	
35	276	626	1,171	2,185	4,072	5,861	7,606	9,321	12,602	15,734	17,300	20,432	23,490	26,472	23,564	18,717	15,361	12,826	10,962	8,725	7,121	-	-	-	-	
40	321	723	1,350	2,520	4,705	6,771	8,799	10,738	14,541	18,195	19,985	23,564	27,069	30,574	28,859	22,893	18,717	15,660	13,423	10,664	-	-	-	-	-	
45	358	820	1,536	2,863	5,339	7,681	9,992	12,155	16,480	20,656	22,744	26,771	30,797	34,675	34,377	27,293	22,371	18,717	15,958	-	-	-	-	-	-	
	A				B				C																	

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 16 – Power ratings for standard single strand roller chain – No. 60, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																								
	10	250	50	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000	4,500
11	134	306	574	1,074	1,544	2,006	2,886	3,743	4,571	5,391	6,189	6,980	7,755	8,501	9,321	8,874	7,017	5,742	4,810	4,109	2,938	2,237	1,775	1,454	1,215
12	149	336	634	1,178	1,700	2,200	3,169	4,109	5,026	5,921	6,801	7,681	8,501	9,396	10,216	10,067	7,979	6,540	5,481	4,683	3,348	2,550	2,021	1,655	1,387
13	164	373	686	1,290	1,857	2,401	3,460	4,482	5,473	6,450	7,412	8,352	9,321	10,216	11,111	11,335	9,023	7,375	6,182	5,280	3,773	2,871	2,282	1,864	-
14	179	403	746	1,394	2,006	2,602	3,743	4,855	5,936	6,987	8,054	9,023	10,067	11,036	12,080	12,677	10,067	8,277	6,905	5,898	4,221	3,214	2,550	2,088	-
15	186	433	805	1,499	2,163	2,804	4,034	5,227	6,391	7,532	8,650	9,769	10,813	11,931	12,975	14,019	11,186	9,172	7,681	6,540	4,683	3,557	2,826	2,312	-
16	201	462	865	1,611	2,319	3,005	4,325	5,608	6,853	8,054	9,247	10,440	11,633	12,751	13,945	15,063	12,304	10,067	8,426	7,203	5,153	3,922	3,110	2,550	-
17	216	641	925	1,723	2,476	3,207	4,623	5,988	7,315	8,650	9,918	11,186	12,453	13,646	14,839	16,107	13,497	11,036	9,247	7,904	5,645	4,295	3,408	2,789	-
18	231	522	977	1,827	2,632	3,415	4,914	6,368	7,755	9,172	10,514	11,857	13,199	14,541	15,809	17,077	14,690	12,006	10,067	8,576	6,152	4,683	3,714	3,042	-
19	246	559	1,037	1,939	2,789	3,617	5,212	6,749	8,277	9,694	11,186	12,602	14,019	15,361	16,778	18,121	15,958	13,050	10,887	9,321	6,674	5,078	4,027	3,296	-
20	261	589	1,096	2,051	2,953	3,825	5,503	7,136	8,725	10,291	11,782	13,348	14,765	16,256	17,748	19,164	17,226	14,094	11,633	10,067	7,203	5,481	4,347	-	-
21	268	619	1,156	2,163	3,110	4,027	5,802	7,532	9,172	10,813	12,453	14,019	15,585	17,151	18,717	20,208	18,493	15,138	12,677	10,813	7,755	5,898	4,683	-	-
22	283	649	1,215	2,274	3,274	4,236	6,107	7,904	9,694	11,409	13,050	14,765	16,405	18,046	19,686	21,252	19,836	16,256	13,572	11,633	8,277	6,324	5,019	-	-
23	298	686	1,275	2,379	3,430	4,444	2,677	8,277	10,142	11,931	13,721	15,511	17,226	18,941	20,656	22,296	21,178	17,375	14,541	12,453	8,874	6,763	5,362	-	-
24	313	671	1,335	2,498	3,594	4,653	6,704	8,650	10,589	12,528	14,392	16,182	18,046	19,836	21,625	23,340	22,595	18,493	15,511	13,124	9,470	7,353	5,720	-	-
25	328	746	1,394	2,610	3,758	4,862	7,010	9,098	11,111	13,050	14,989	16,927	18,866	20,730	22,595	24,384	24,012	19,686	16,480	14,094	10,067	7,681	6,077	-	-
26	343	783	1,454	2,722	3,915	5,078	7,308	9,470	11,558	13,646	15,660	17,673	19,686	21,625	23,564	25,428	25,503	20,880	17,449	14,914	10,664	8,128	6,376	-	-
28	373	843	1,581	2,946	4,243	5,496	7,904	10,291	12,528	14,765	17,002	19,164	21,252	23,415	25,503	27,591	28,486	23,340	19,537	16,704	11,931	9,098	-	-	-
30	403	910	1,700	3,177	4,571	5,921	8,501	11,036	13,497	15,958	18,270	20,656	22,968	25,205	27,442	29,679	31,618	25,876	21,700	18,493	13,273	10,067	-	-	-
32	425	977	1,827	3,400	4,899	6,353	9,172	11,857	14,467	17,077	19,612	22,147	24,608	27,069	29,455	31,841	34,824	28,486	23,862	20,358	14,616	11,111	-	-	-
35	470	1,074	2,006	3,751	5,399	6,995	10,067	13,050	15,958	18,792	21,625	24,384	27,069	29,753	32,438	35,122	39,820	32,587	27,293	23,340	16,704	12,677	-	-	-
40	544	1,245	2,319	4,333	6,242	8,054	11,633	15,063	18,419	21,700	24,981	28,113	31,319	34,377	37,509	40,566	46,606	39,820	33,333	28,486	20,358	-	-	-	-
45	619	1,409	2,632	4,922	7,084	9,172	13,199	17,151	20,954	24,683	28,337	31,319	35,570	39,075	42,579	46,010	52,870	47,501	39,820	34,004	24,310	-	-	-	-
	A			B				C																	

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 17 – Power ratings for standard single strand roller chain – No. 80, watts

No. of teeth small sprocket	Revolutions per minute of small sprocket																											
	10	25	50	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,700	3,000	3,400			
11	313	723	1,342	2,506	3,609	4,683	6,741	8,725	10,664	12,602	14,467	16,331	17,151	14,616	12,677	11,111	8,799	7,226	6,055	5,168	4,482	3,930	3,296	2,811	1,268			
12	350	790	1,476	2,752	3,967	5,138	7,405	9,620	11,707	13,795	15,883	17,897	19,537	16,629	14,467	12,677	10,067	8,203	6,898	5,511	5,108	4,482	3,758	3,207	-			
13	380	865	1,611	3,005	4,325	5,608	8,054	10,440	12,751	15,063	17,300	19,537	21,700	18,792	16,256	14,317	11,335	9,321	7,755	6,644	5,757	5,056	4,236	3,617	-			
14	410	932	1,745	3,251	4,690	6,070	8,725	11,335	13,870	16,331	18,717	21,178	23,490	19,537	18,195	15,958	12,677	10,365	8,725	7,442	6,435	5,645	4,735	4,042	-			
15	440	1,007	1,879	3,505	5,048	6,540	9,396	12,229	14,914	17,599	20,208	22,818	25,354	23,266	20,208	17,375	14,094	12,229	9,620	8,203	7,136	6,264	5,250	4,929	-			
16	470	1,081	2,013	3,758	5,414	7,017	10,067	13,124	16,033	18,866	21,625	24,459	27,143	25,652	22,222	19,537	15,511	12,677	10,589	9,098	7,830	6,898	5,787	5,086	-			
17	507	1,156	2,148	4,012	5,779	7,457	10,813	13,945	17,077	20,134	23,117	26,100	29,008	28,113	24,384	21,402	16,927	13,870	11,633	9,918	8,576	7,532	-	-	-			
18	537	1,223	2,289	4,265	6,152	7,979	11,484	14,839	18,195	21,402	24,608	27,740	30,872	30,648	26,547	23,266	18,493	15,138	12,677	10,813	9,396	8,203	-	-	-			
19	567	1,298	2,424	4,526	6,517	8,426	12,155	15,734	19,239	22,669	26,100	29,381	32,662	33,184	28,784	25,279	20,059	16,405	13,721	11,707	10,142	8,948	-	-	-			
20	604	1,372	2,565	4,780	6,890	8,948	12,826	16,629	20,358	24,012	27,591	31,096	34,526	33,631	31,096	27,293	21,625	17,748	14,839	12,677	10,962	9,620	-	-	-			
21	634	1,447	2,699	5,041	7,263	9,396	13,572	17,524	21,476	25,279	29,082	32,736	36,465	38,553	33,407	29,381	23,266	19,090	15,958	13,646	11,857	10,365	-	-	-			
22	671	1,521	2,841	5,302	7,606	9,918	14,243	18,493	22,595	26,621	30,574	34,451	38,329	41,386	34,377	31,469	24,981	20,432	17,151	14,616	12,677	11,111	-	-	-			
23	701	1,596	2,983	5,555	7,979	10,365	14,989	19,388	23,713	27,889	32,065	36,166	40,193	44,220	38,329	33,631	26,323	22,222	18,493	15,660	13,572	11,857	-	-	-			
24	731	1,670	3,124	5,824	8,426	10,887	15,660	20,283	24,757	29,231	33,557	37,882	42,057	46,233	40,864	35,868	28,486	23,266	19,537	16,629	14,467	12,677	-	-	-			
25	768	1,745	3,259	6,085	8,799	11,335	16,331	21,178	25,876	30,499	35,048	39,522	43,996	48,321	43,549	38,105	30,275	24,757	20,730	17,748	15,511	-	-	-	-			
26	798	1,827	3,400	6,353	9,172	11,857	17,077	22,147	26,994	31,841	36,614	41,237	45,861	50,409	46,084	40,417	32,065	26,249	21,252	18,792	16,256	-	-	-	-			
28	865	1,969	3,684	6,883	9,918	12,826	18,493	23,937	29,306	34,526	39,671	44,667	49,738	54,660	51,453	45,189	33,631	29,381	21,625	21,774	18,195	-	-	-	-			
30	932	2,125	3,975	7,412	10,664	13,795	19,910	25,801	31,543	37,210	42,729	48,172	53,541	57,344	57,121	50,111	39,746	32,513	27,293	23,266	20,208	-	-	-	-			
32	999	2,282	4,258	7,979	11,409	14,839	21,327	27,665	33,855	39,895	45,786	51,602	57,419	63,086	62,863	55,182	43,773	34,377	30,052	25,652	-	-	-	-	-			
35	1,104	2,513	4,690	8,725	12,602	16,331	23,564	30,499	37,285	43,922	50,409	56,897	63,235	69,574	73,451	63,161	50,111	41,014	35,868	29,381	-	-	-	-	-			
40	1,275	2,901	5,421	10,142	14,541	18,866	27,143	35,197	43,027	50,708	58,239	65,696	73,079	80,536	87,247	76,807	61,222	50,111	-	-	-	-	-	-	-			
45	1,447	3,296	6,152	11,484	16,555	21,402	30,872	39,970	48,918	57,568	66,144	74,570	82,773	90,975	99,178	91,721	73,079	59,805	-	-	-	-	-	-	-			
	A			B					C																			

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 18 – Power ratings for standard single strand roller chain – No. 100, watts

No. of teeth small sprocket	Revolutions per minute - Small sprocket																			
	10	25	50	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,600	1,800
11	604	1,380	2,573	4,802	6,920	8,948	12,901	16,704	20,432	24,086	27,665	24,459	20,507	17,449	15,138	13,273	12,528	10,589	8,650	7,241
12	664	1,514	2,826	5,280	7,606	9,843	14,168	18,344	22,446	26,472	30,425	27,815	23,340	19,910	17,300	15,138	13,423	12,006	9,843	8,277
13	723	1,655	3,080	5,757	8,277	10,738	15,436	20,059	24,459	28,859	33,184	31,394	26,323	22,446	19,463	17,077	15,138	13,572	11,111	9,321
14	783	1,790	3,341	6,234	8,948	12,379	16,778	21,700	26,547	31,245	35,943	35,048	29,381	25,130	21,774	19,090	16,927	15,138	12,379	10,365
15	843	1,931	3,602	6,719	9,694	12,528	18,046	23,415	28,560	33,706	38,702	38,926	32,587	27,815	24,161	21,178	18,792	16,778	13,721	11,558
16	910	2,066	3,855	7,203	10,365	13,423	19,388	25,056	30,648	36,092	41,461	42,878	35,943	30,648	26,621	23,340	20,656	18,568	15,138	12,677
17	969	2,207	4,116	7,681	11,036	14,317	20,656	26,771	32,736	38,553	44,295	46,979	39,373	33,557	29,082	25,578	22,669	20,283	16,629	-
18	1,029	2,349	4,385	8,203	11,782	15,287	21,998	28,486	34,824	41,014	47,128	47,427	42,878	36,614	31,692	27,815	24,683	22,073	18,046	-
19	1,089	2,491	4,646	8,650	12,453	16,182	23,266	30,201	36,912	43,474	49,962	55,480	46,457	39,671	34,377	30,201	26,771	23,937	19,612	-
20	1,156	2,632	4,907	9,172	13,199	17,077	24,608	31,916	39,000	45,935	52,796	59,507	50,186	42,878	37,136	32,587	28,933	25,876	21,178	-
21	1,215	2,774	5,175	9,694	13,945	18,046	25,950	33,631	41,088	48,471	55,629	62,788	53,989	46,084	39,970	35,048	31,096	27,815	22,818	-
22	1,275	2,916	5,444	10,142	14,616	18,941	27,293	35,346	43,251	50,931	58,537	65,994	57,941	49,440	42,878	37,583	33,333	29,828	24,459	-
23	1,342	3,057	5,712	10,664	15,361	19,910	28,635	37,136	45,339	53,467	61,371	69,201	61,893	52,870	45,786	40,193	35,644	31,916	26,100	-
24	1,402	3,207	5,981	11,186	16,033	20,805	29,977	38,851	47,501	55,928	63,534	72,482	65,994	56,599	63,757	42,878	38,031	34,004	27,815	-
25	1,469	3,348	6,249	11,633	16,778	21,774	31,319	40,566	49,664	58,463	67,188	76,061	70,170	59,880	51,901	45,562	40,417	36,166	-	-
26	1,529	3,490	6,517	12,155	17,524	22,669	32,662	42,356	51,752	60,998	70,096	79,044	74,421	63,534	55,033	47,949	42,878	38,329	-	-
28	1,655	3,781	7,062	13,199	19,015	24,608	35,421	45,861	56,077	66,069	76,061	85,756	83,518	70,991	61,520	53,989	47,874	42,878	-	-
30	1,790	4,079	7,606	14,168	20,432	26,472	38,180	49,440	60,402	71,214	82,027	92,467	92,467	79,044	68,232	59,880	53,094	47,501	-	-
32	1,916	4,370	8,128	15,212	21,924	28,411	40,939	53,019	64,056	76,061	87,993	99,178	101,415	86,501	75,316	65,994	58,537	52,348	-	-
35	2,110	4,817	8,948	16,778	24,161	31,319	45,040	58,388	71,363	84,264	96,941	108,872	116,329	99,178	85,756	75,316	-	-	-	-
40	2,438	5,563	10,365	19,388	27,889	36,166	52,050	67,411	82,773	96,941	111,855	126,023	140,192	121,549	105,144	92,467	-	-	-	-
45	2,767	6,316	11,782	21,998	31,692	41,014	59,134	76,807	93,958	110,364	126,769	143,174	158,834	144,666	-	-	-	-	-	-
	A			B				C												

Type A: Manual or drip lubrication
 Type B: Bath or disc lubrication
 Type C: Oil or stream lubrication

Table 19 – Power ratings for standard single strand roller chain – No. 120

No. of teeth small sprocket	Revolutions per minute of small sprocket																									
	10	25	50	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1500	1600	1,700	1,800	1,900	2,000		
11	1,022	2,327	4,347	8,128	11,707	15,138	21,774	28,262	34,526	40,715	34,526	28,262	23,713	20,208	17,524	15,361	13,646	12,229	11,036	9,992	9,098	8,352	7,755	6,338		
12	1,119	2,558	4,772	8,874	12,826	16,629	23,937	31,021	37,956	44,667	39,373	32,214	26,994	23,042	19,985	17,524	15,585	13,945	12,528	11,335	10,365	9,545	8,650	7,457		
13	1,223	2,789	5,205	9,694	14,019	18,121	26,100	33,855	41,386	48,694	44,369	36,316	30,425	26,025	22,520	19,761	17,524	15,660	14,168	12,826	11,707	10,738	9,918	9,172		
14	1,327	3,020	5,637	10,514	15,138	19,612	28,262	36,614	44,817	52,796	49,589	40,566	34,004	29,082	25,205	22,073	19,612	17,524	15,809	14,317	13,124	12,006	10,440	6,667		
15	1,424	3,259	6,077	11,335	16,331	21,178	30,499	39,522	48,247	56,897	55,033	45,040	37,732	32,214	27,889	24,534	21,700	19,463	17,524	15,883	14,839	13,348	11,558	-		
16	1,529	3,490	6,517	12,155	17,524	22,669	32,662	42,356	51,752	60,998	60,625	49,589	41,535	35,495	30,723	26,994	23,937	21,402	18,643	17,524	16,033	14,690	13,572	-		
17	1,633	3,729	6,957	12,975	18,717	24,235	34,899	45,189	55,256	65,100	66,367	54,287	45,488	38,851	33,706	29,530	26,249	23,490	21,178	19,090	17,599	16,107	14,168	-		
18	1,737	3,967	7,397	13,795	19,910	25,801	37,136	48,098	58,761	69,276	72,333	59,209	49,589	42,356	36,688	32,214	28,560	26,025	22,595	19,463	19,314	17,524	8,277	-		
19	1,842	4,206	7,830	14,616	21,103	27,293	39,373	51,006	62,341	73,451	78,299	64,205	53,765	45,935	39,820	34,899	30,947	27,740	24,981	22,669	20,730	19,015	-	-		
20	1,946	4,444	8,277	15,436	22,296	28,859	41,610	53,840	65,845	77,553	85,010	69,276	58,090	49,589	42,952	37,732	33,482	29,903	26,994	24,534	23,042	20,507	-	-		
21	2,051	4,683	8,725	16,331	23,490	30,425	43,847	56,822	69,425	82,027	90,975	74,570	62,490	53,392	46,233	40,566	36,017	32,214	29,082	26,398	24,086	22,818	-	-		
22	2,163	4,922	9,172	17,151	24,683	31,991	46,084	59,731	73,004	85,756	97,687	79,790	67,038	57,195	49,589	43,549	38,627	34,526	31,170	28,262	25,801	14,168	-	-		
23	2,267	5,168	9,620	17,971	25,950	33,557	48,396	62,639	76,807	90,230	103,652	85,756	71,662	61,147	53,019	46,532	41,983	36,912	33,258	30,201	27,591	-	-	-		
24	2,371	5,406	10,067	18,866	27,143	35,122	50,633	65,622	80,536	94,704	108,872	90,975	76,061	65,174	56,524	49,589	43,996	39,224	35,719	32,214	29,381	-	-	-		
25	2,476	5,652	10,514	19,686	28,337	36,763	52,945	68,530	83,518	98,432	113,346	96,941	81,281	69,276	60,103	52,721	46,755	41,834	37,732	34,228	30,723	-	-	-		
26	2,588	5,898	11,036	20,507	29,604	38,329	55,182	71,513	87,247	102,907	118,566	102,907	85,756	73,526	63,683	55,928	49,589	44,369	40,044	36,316	27,293	-	-	-		
28	2,804	6,391	11,931	22,222	32,065	41,535	59,805	77,553	94,704	111,855	128,260	114,838	96,195	82,027	71,214	62,341	55,853	48,843	44,742	41,312	-	-	-	-		
30	3,020	6,883	12,826	23,937	34,526	44,742	64,428	83,518	102,161	120,058	137,955	127,515	106,635	90,975	79,044	68,604	61,446	54,884	49,589	31,618	-	-	-	-		
32	3,236	7,382	13,795	25,727	36,987	47,949	69,052	89,484	109,618	129,006	148,394	140,192	117,821	100,670	87,247	76,061	67,710	60,625	54,660	-	-	-	-	-		
35	3,564	8,128	15,138	28,337	40,790	52,870	76,061	98,432	120,803	141,683	163,308	160,326	134,226	114,838	100,670	87,247	77,553	61,819	35,570	-	-	-	-	-		
40	4,116	9,396	17,524	32,736	47,128	60,998	87,993	114,092	139,446	164,054	188,662	173,748	164,054	140,937	121,549	106,635	94,704	66,740	-	-	-	-	-	-		
45	4,676	10,664	19,910	37,136	53,467	69,276	99,924	129,006	158,088	186,425	214,016	234,150	196,119	167,037	145,412	127,515	59,656	-	-	-	-	-	-	-		
	A	B					C																			

Type A: Manual or drip lubrication

Type B: Bath or disc lubrication

Type C: Oil or stream lubrication

Table 20 – Roller chain drive service factors

Type of driven load	Type of input power		
	Internal combustion engine with hydraulic drive	Electric motor or turbine	Internal combustion engine with mechanical drive
Smooth	1.0	1.0	1.2
Moderate shock	1.2	1.3	1.4
Heavy shock	1.4	1.5	1.7

Table 21 – Multiple-strand factors

Number of strands	Multiple strand factor
2	1.7
3	2.5
4	3.3

7.6.2 The power rating presented in Table 10 - 17 is based on a service life of 15,000 hours. However, the commonly used design life for agricultural machines is only 5,000 hours thus the actual power rating is:

$$Power\ rating\ required = \frac{Design\ power \times Design\ life}{15,000} \dots\dots\dots [Eq. 4]$$

7.7 Lubrication

7.7.1 Type I (Manual Lubrication)

Oil is supplied periodically with brush or spout can, preferably once every eight hours of operation. Volume and frequency should be sufficient to prevent discoloration of lubricants in the chain joints.

7.7.2 Type II (Drip lubrication)

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

7.7.3 Type III (Bath or disc lubrication)

With bath lubrication the lower strand of the chain runs through a sump of oil in the drive housing. The oil level should reach the pitch line of the chain at its lowest point while operating. With disc lubrication, the chain operates above the oil level. The disc picks up oil from the sump and deposits it into the chain, usually by means of a through. The diameter of the disc should be such as to produce rim speeds between 183 m/min minimum and 2438 m/min maximum.

7.7.4 Type IV (Oil stream lubrication)

The lubricant is usually supplied by a circulating pump capable of supplying each chain drive with a continuous stream of oil. The oil should be applied inside the chain loop evenly across the chain width, and directed at the lower strand.

8 Safety

8.1 Enclosing the drive with cover is recommended for safety and to avoid foreign materials from getting in contact with the drive.

8.2 Make drive inspection on a periodic basis. Drives should be inspected for tightness of links, condition of the chains and lubricants

8.3 Use sprockets and chains with proper markings.

8.4 Use proper keys as specified in PAES 304:2000.

ANNEX A
(Informative)

Example of chain drive selection

A.1 Given parameters

Select a roller chain drive to transmit 7,457 W from a drive shaft to a driven shaft of a fruit conveyor. The drive shaft is 20 mm in diameter and operates at 1200 rpm. The driven shaft is also 20 mm in diameter and must operate between 370 and 390 rpm. Shaft centers, once established, are fixed and by initial calculations must be approximately 572 mm. The load on the driven shaft is uneven and presents “peaks” which places it in the heavy shock load category. The input power is supplied by an electric motor. The driving head is fully enclosed and all parts are lubricated from a central system.

A.2 Service factor

From Table 5 the service factor for heavy shock load and an electric motor drive is 1.5.

A.3 Design power

The power upon which the chain selection is based, is equal to the specified power multiplied by the service factor as shown in the equation below:

$$\begin{aligned} \text{Power rating} &= \text{Power to be transmitted} \times \text{service factor} \\ &= 7,457 \text{ W} \times 1.5 \\ &= 11,185.5 \text{ W} \end{aligned}$$

A.4 Required power rating

The actual power required is computed as:

$$\text{Power rating required} = \frac{\text{Designed power} \times \text{Designed life}}{15,000} = \frac{11,185 \text{ W} \times 5,000 \text{ h}}{15,000 \text{ h}} = 3728.5 \text{ W}$$

A.5 Chain pitch and small sprocket size for single strand drive

In selecting the type of chain and the number of teeth, refer to Tables 11 to 19. Use the table that will give the least number of teeth. In Table 4 under 1,200 rpm and the required power rating, a chain number 40 with a 14 teeth sprocket should be used.

A.6 Check of chain pitch and sprocket selection

From Table 10 it is seen that the 14 teeth sprocket in A.5 can be bored to fit the 29 mm diameter main shaft. In Table 13 a 13 mm pitch chain at a small sprocket speed of 1,200 rpm is rated at 3,602 W for a 14 teeth sprocket.

A.7 Selection of large sprocket

A.7.1 Since the driver is to operate at 1200 rpm and the driven at a minimum of 378 rpm, the speed ratio is $1,200/378 = 3.175$. Therefore the large sprocket should have $14 \times 3.175 = 44.45$ teeth (use 45).

A.7.2 The combination of 14 and 45 teeth will produce a main drive shaft speed of 373 rpm which is in the limitation of 370 to 390 rpm established in the original specification.

A.8 Computation of chain length

Since 14 and 45 teeth sprockets are to be placed on 572 mm, the length is determined from the formula:

$$L_p = 2C_p + \frac{N}{2} + \frac{n}{2} + \left(\frac{N-n}{2\pi} \right)^2 \left(\frac{1}{C_p} \right)$$

thus;

$$L_p = 2 \times \frac{572 \text{ mm}}{12.7} + \frac{45}{2} + \frac{14}{2} + \left(\frac{45-14}{2\pi} \right)^2 \left(\frac{1}{45.039} \right) = 120.11$$

$$L_p = 120 \text{ pitches}$$

A.9 Correction of center distance

Since the chain is to couple at an even number of pitches, 120 pitches will be used and the center distance recomputed based on this figure using the formula:

$$C = \frac{P}{8} \left[2L_p - N - n + \sqrt{(2L_p - N - n)^2 - 0.810(N - n)^2} \right]$$

thus;

$$C = \frac{12.7}{8} \left[2 \times 120 - 45 - 14 + \sqrt{(2 \times 120 - 40 - 14)^2 - 0.810(45 - 14)^2} \right] = 571.24 \text{ mm}$$