

表用實輪齒

東北有色金屬學會出版

1950

齒輪實用表

1050.10

基本定價

齒輪實用表

東北有色金屬學會出版

1950



数据加载失败，请稍后重试！

齒輪實用表

目 錄

齒輪齒的尺寸比較	(1)
----------------	-------

齒輪齒的尺寸比較 (其一)	(1)
---------------------	-------

齒輪齒的尺寸比較 (其二)	(2)
---------------------	-------

A 齒輪外徑及節圓直徑的使用法	(3)
-----------------------	-------

a 徑節 (p) 基準	
-----------------------	--

..... 齒輪外徑及節圓徑表	(5)
-----------------------	-------

b 周節 (p') 基準	
------------------------	--

..... 齒輪外徑及節圓徑表	(35)
-----------------------	--------

c 模數 (M) 基準	
-----------------------	--

..... 齒輪外徑及節圓徑表	(55)
-----------------------	--------

B 無音鍵用鏈輪之外徑及節圓直徑表使用法	(79)
----------------------------	--------

a 無音鍵用鏈輪之外徑	
-------------------	--

..... 及節圓徑表	(81)
-------------------	--------

C 滾鏈用鏈輪之節圓徑表使用法	(83)
-----------------------	--------

α 滾子鏈用鏈輪之.....

.....節圓徑表..... (85)

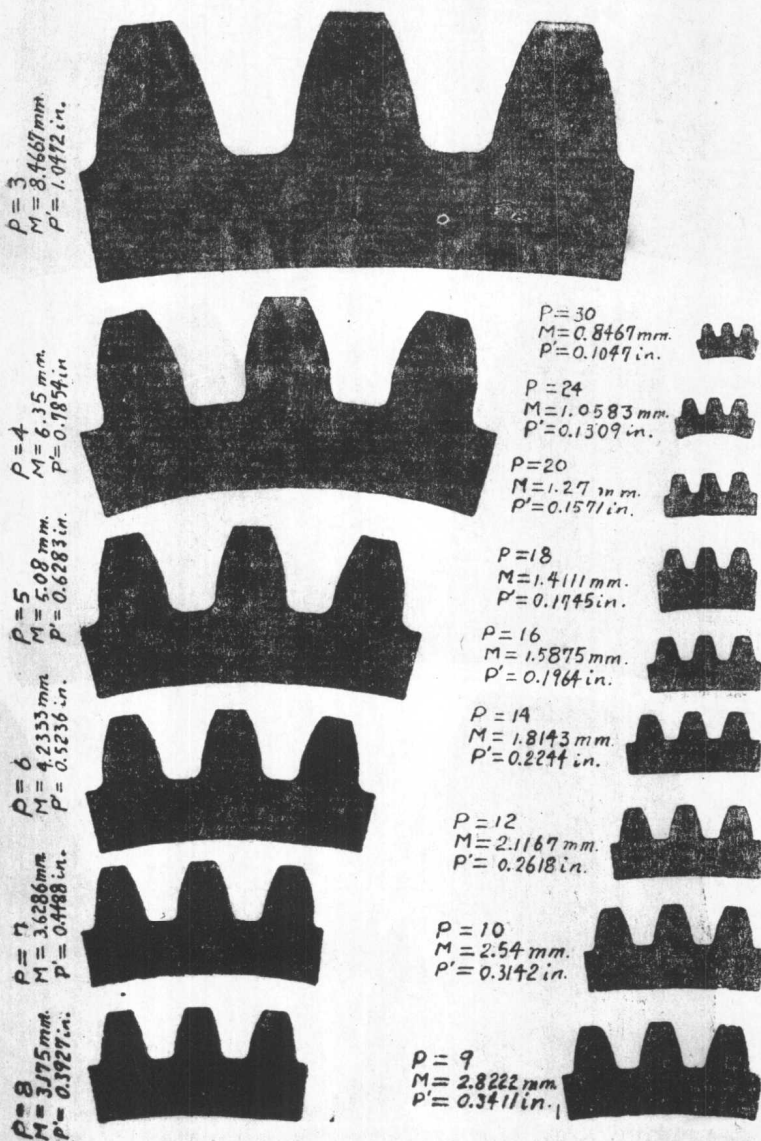
D 活式環鏈用鏈輪之節圓直徑表使用法..... (91)

α 活環鏈用鏈輪之.....

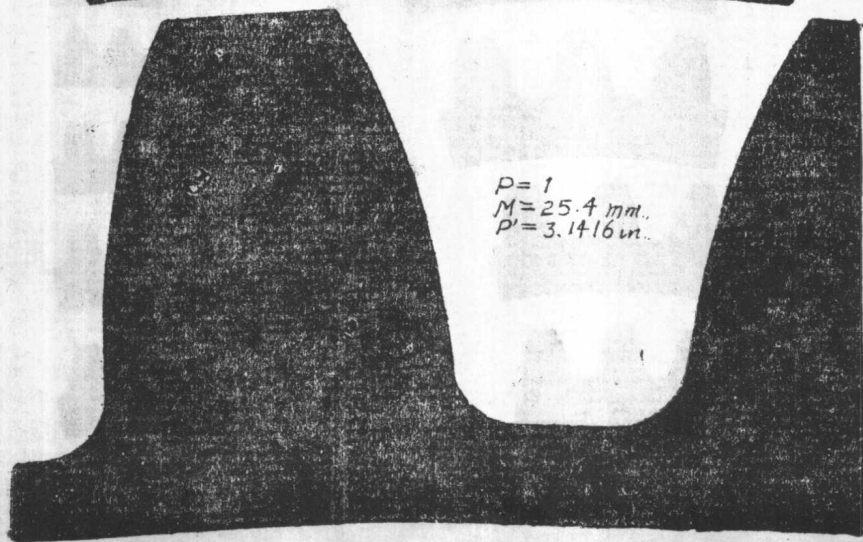
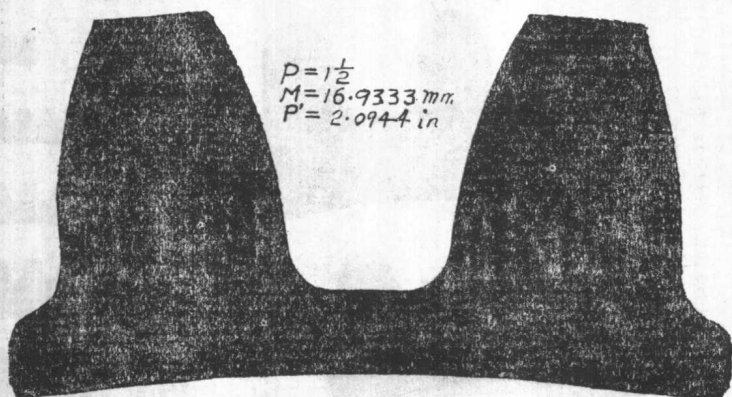
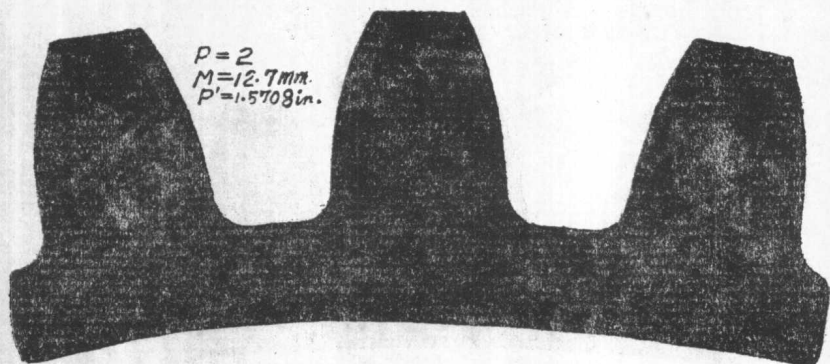
.....節圓徑表..... (93)

時耗換算表..... (103)

齒輪齒之尺寸比較 (其一)



齒輪齒之尺寸比較 (其二)



A. 齒輪外徑及節圓直徑之使用法

在齒輪外徑及節圓直徑表上，載有以下三種方法：

1. 徑節 (*Diametral pitch*) 即以 P 為基準者
 2. 周節 (*Circular pitch*) 即以 P' 為基準者
 3. 模數 (*Module*) 即以 M 為基準者
- 表中齒節 (*Pitch*) 之範圍，網羅有

1. 對於徑節 (P) 有……… $P=30\sim1$
2. 對於周節 (P') 有……… $P'=\frac{1}{8}\sim3in.$
3. 對於模數 (M) 有……… $M=1\sim20mm.$

凡對齒數 $N=8\sim130$ 枚之各齒輪的外徑及節圓直徑，亦無不全部掲載於此。

並於各表，一一插入了標明尺寸的齒形圖，以免計算之煩。

外徑 ($O.S.D.$) 及節圓直徑 ($P.C.D.$) 之計算，係按下列算式所算出者，表中之單位，統用 mm 以表示之。

$$P.C.D.=M\times N$$

$$O.S.D.=M\times(N+2)$$

例如：徑節 $P=30$ ；齒數 $N=20$ ；時

$$\text{則外徑}(O.S.D.)=18.63mm.$$

$$\text{節圓直徑}(P.C.D.)=16.93mm.$$

例如：周節 $P'=\frac{1}{8}in$ ；齒數 $N=20$ ；時

$$\text{則外徑}(O.S.D.)=22.23mm.$$

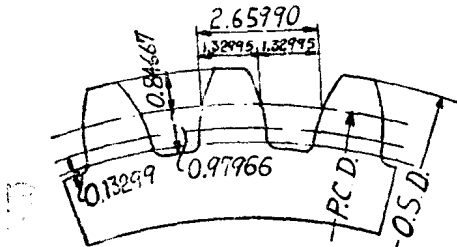
$$\text{節圓直徑}(P.C.D.)=20.21mm.$$

例如：模數 $M=1$ ；齒數 $M=20$ ；時

則外徑 ($O.S.D.$) $=22.00mm$

節圓直徑 ($P.C.D.$) $=20.00mm$

徑節 (P) 基準…齒輪外徑及節圓徑表



$$P=30$$

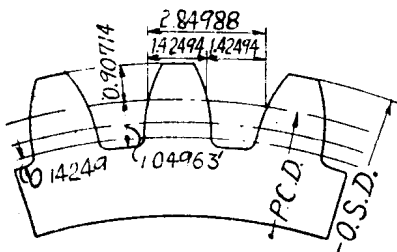
$$M=0.84667$$

$$P.C.D.=M \times N$$

$$O.S.D.=M \times (N+2)$$

齒數 N	外 徑	節圓徑	齒數 N	外 徑	節圓徑	齒數 N	外 徑	節圓徑
	O.S.D. mm.	P.C.D. mm.		O.S.D. mm.	P.C.D. mm.		O.S.D. mm.	P.C.D. mm.
8	8.47	6.77	49	43.18	41.49	90	77.89	76.20
9	9.31	7.62	50	44.03	42.33	91	78.74	77.05
10	10.16	8.47	51	44.87	43.18	92	79.59	77.89
11	11.07	9.31	52	45.72	44.03	93	80.43	78.74
12	11.85	10.16	53	46.57	44.87	94	81.28	79.59
13	12.70	11.01	54	47.41	45.72	95	82.13	80.43
14	13.55	11.85	55	48.26	46.57	96	82.97	81.28
15	14.39	12.70	56	49.11	47.41	97	83.82	82.13
16	15.24	13.55	57	49.95	48.26	98	84.67	82.97
17	16.09	14.39	58	50.80	49.11	99	85.51	83.82
18	16.93	15.24	59	51.65	49.95	100	86.36	84.67
19	17.78	16.09	60	52.49	50.80	101	87.21	85.51
20	18.63	16.93	61	53.34	51.65	102	88.05	86.36
21	19.47	17.78	62	54.19	52.49	103	88.90	87.21
22	20.32	18.63	63	55.03	53.34	104	89.75	88.05
23	21.17	19.47	64	55.88	54.19	105	90.59	88.90
24	22.01	20.32	65	56.73	55.03	106	91.44	89.75
25	22.86	21.17	66	57.57	55.88	107	92.29	90.59
26	23.71	22.01	67	58.42	56.73	108	93.13	91.44
27	24.55	22.86	68	59.27	57.57	109	93.98	92.29
28	25.40	23.71	69	60.11	58.42	110	94.83	93.13
29	26.25	24.55	70	60.96	59.27	111	95.67	93.98
30	27.09	25.40	71	61.81	60.11	112	96.52	94.83
31	27.94	26.25	72	62.65	60.96	113	97.37	95.67
32	28.79	27.09	73	63.50	61.81	114	98.21	96.52
33	29.63	27.94	74	64.35	62.65	115	99.06	97.37
34	30.48	28.79	75	65.19	63.50	116	99.91	98.21
35	31.33	29.63	76	66.04	64.35	117	100.75	99.06
36	32.17	30.48	77	66.89	65.19	118	101.60	99.91
37	33.02	31.33	78	67.73	66.04	119	102.45	100.75
38	33.87	32.17	79	68.58	66.89	120	103.29	101.60
39	34.71	33.02	80	69.43	67.73	121	104.14	102.45
40	35.56	33.87	81	70.27	68.58	122	104.99	103.29
41	36.41	34.71	82	71.12	69.43	123	105.83	104.14
42	37.25	35.56	83	71.97	70.27	124	106.68	104.99
43	38.10	36.41	84	72.81	71.12	125	107.53	105.83
44	38.95	37.25	85	73.66	71.97	126	108.37	106.68
45	39.79	38.10	86	74.51	72.81	127	109.22	107.53
46	40.64	38.95	87	75.35	73.66	128	110.07	108.37
47	41.49	39.79	88	76.20	74.51	129	110.91	109.22
48	42.33	40.64	89	77.05	75.35	130	111.76	100.07

徑節 (P) 基準 齒輪外徑及節圓徑表



$$P=28$$

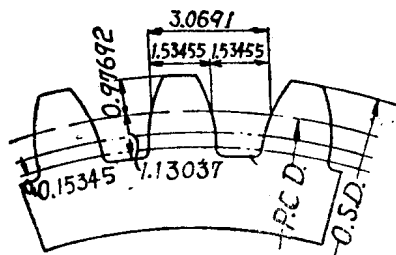
$$M=0.90714$$

$$P.C.D.=M \times N$$

$$O.S.D.=M \times (N+Z)$$

齒數 N	外徑	節圓徑	齒數 N	外徑	節圓徑	齒數 N	外徑	節圓徑
	O.S.D. mm.	P.C.D. mm.		O.S.D. mm.	P.C.D. mm.		O.S.D. mm.	P.C.D. mm.
8	9.07	7.26	49	46.26	44.45	90	83.46	81.64
9	9.98	8.16	50	47.17	45.36	91	84.36	82.55
10	10.89	9.07	51	48.08	46.26	92	85.27	83.46
11	11.79	9.98	52	48.99	47.17	93	86.18	84.36
12	12.70	10.89	53	49.89	48.08	94	87.09	85.27
13	13.61	11.79	54	50.80	48.99	95	87.99	86.18
14	14.51	12.70	55	51.71	49.89	96	88.90	87.09
15	15.42	13.61	56	52.61	50.80	97	89.81	87.99
16	16.33	14.51	57	53.52	51.71	98	90.71	88.90
17	17.24	15.42	58	54.43	52.61	99	91.62	89.81
18	18.14	16.33	59	55.34	53.52	100	92.53	90.71
19	19.05	17.24	60	56.24	54.43	101	93.44	91.62
20	19.96	18.14	61	57.15	55.34	102	94.34	92.53
21	20.86	19.05	62	58.06	56.24	103	95.25	93.44
22	21.77	19.96	63	58.96	57.15	104	96.16	94.34
23	22.68	20.86	64	59.87	58.06	105	97.06	95.25
24	23.59	21.77	65	60.78	58.96	106	97.97	96.16
25	24.49	22.68	66	61.69	59.87	107	98.88	97.06
26	25.40	23.59	67	62.59	60.78	108	99.79	97.97
27	26.31	24.49	68	63.50	61.69	109	100.69	98.88
28	27.21	25.40	69	64.41	62.59	110	101.60	99.79
29	28.12	26.31	70	65.31	63.50	111	102.51	100.69
30	29.03	27.21	71	66.22	64.41	112	103.41	101.60
31	29.94	28.12	72	67.13	65.31	113	104.32	102.51
32	30.84	29.03	73	68.04	66.22	114	105.23	103.41
33	31.75	29.94	74	68.94	67.13	115	106.14	104.32
34	32.66	30.84	75	69.85	68.04	116	107.04	105.23
35	33.56	31.75	76	70.76	68.94	117	107.95	106.14
36	34.47	32.66	77	71.66	69.85	118	108.86	107.04
37	35.38	33.56	78	72.57	70.76	119	109.76	107.95
38	36.29	34.47	79	73.48	71.66	120	110.67	108.86
39	37.19	35.38	80	74.39	72.57	121	111.58	109.76
40	38.10	36.29	81	75.29	73.48	122	112.49	110.67
41	39.01	37.19	82	76.20	74.39	123	113.39	111.58
42	39.91	38.10	83	77.11	75.29	124	114.30	112.49
43	40.82	39.01	84	78.01	76.20	125	115.21	113.39
44	41.73	39.91	85	78.92	77.11	126	116.11	114.30
45	42.64	40.82	86	79.83	78.01	127	117.02	115.21
46	43.54	41.73	87	80.74	78.92	128	117.93	116.11
47	44.45	42.64	88	81.64	79.83	129	118.84	117.02
48	45.36	43.54	89	82.55	80.74	130	119.74	117.93

徑節 (P) 基準 齒輪外徑及節圓徑表



$$P=26$$

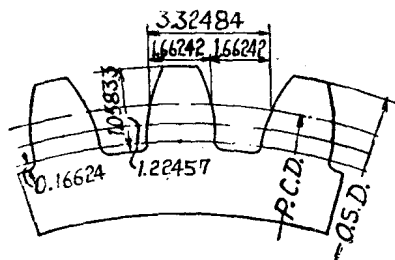
$$M=0.97692$$

$$P.C.D.=M \times N$$

$$O.S.D.=M \times (N+2)$$

齒數 N	外徑		齒數 N	外徑		齒數 N	外徑	
	O.S.D.	P.C.D.		O.S.D.	P.C.D.		O.S.D.	P.C.D.
	mm.	mm.		mm.	mm.		mm.	mm.
8	9.77	7.82	49	49.82	47.87	90	89.88	87.92
9	10.75	8.79	50	50.80	48.85	91	90.85	88.90
10	11.72	9.77	51	51.78	49.82	92	91.83	89.88
11	12.70	10.75	52	52.75	50.80	93	92.81	90.85
12	13.68	11.72	53	53.73	51.78	94	93.78	91.83
13	14.65	12.70	54	54.71	52.75	95	94.76	92.81
14	15.63	13.68	55	55.68	53.73	96	95.74	93.78
15	16.61	14.65	56	56.66	54.71	97	96.72	94.76
16	17.58	15.63	57	57.64	55.68	98	97.69	95.74
17	18.56	16.61	58	58.62	56.66	99	98.67	96.72
18	19.54	17.58	59	59.59	57.64	100	99.65	97.69
19	20.52	18.56	60	60.57	58.62	101	100.62	98.67
20	21.49	19.54	61	61.55	59.59	102	101.60	99.65
21	22.47	20.52	62	62.52	60.57	103	102.58	100.62
22	23.45	21.49	63	63.50	61.55	104	103.55	101.60
23	24.42	22.47	64	64.48	62.52	105	104.53	102.58
24	25.40	23.45	65	65.45	63.50	106	105.51	103.55
25	26.38	24.42	66	66.43	64.48	107	106.48	104.53
26	27.35	25.40	67	67.41	65.45	108	107.46	105.51
27	28.33	26.38	68	68.38	66.43	109	108.44	106.48
28	29.31	27.35	69	69.36	67.41	110	109.42	107.46
29	30.28	28.33	70	70.34	68.38	111	110.39	108.44
30	31.26	29.31	71	71.32	69.36	112	111.37	109.42
31	32.24	30.28	72	72.29	70.34	113	112.35	110.39
32	33.22	31.26	73	73.27	71.32	114	113.32	111.37
33	34.19	32.24	74	74.25	72.29	115	114.30	112.35
34	35.17	33.22	75	75.22	73.27	116	115.28	113.32
35	36.15	34.19	76	76.20	74.25	117	116.25	114.30
36	37.12	35.17	77	77.18	75.22	118	117.23	115.28
37	38.10	36.15	78	78.15	76.20	119	118.21	116.25
38	39.08	37.12	79	79.13	77.18	120	119.18	117.23
39	40.05	38.10	80	80.11	78.15	121	120.16	118.21
40	41.03	39.08	81	81.08	79.13	122	121.14	119.18
41	42.01	40.05	82	82.06	80.11	123	122.12	120.16
42	42.98	41.03	83	83.04	81.08	124	123.09	121.14
43	43.96	42.01	84	84.02	82.06	125	124.07	122.12
44	44.94	42.98	85	84.99	83.04	126	125.05	123.09
45	45.92	43.96	86	85.97	84.02	127	126.02	124.07
46	46.89	44.94	87	86.95	84.99	128	127.00	125.05
47	47.87	45.92	88	87.92	85.97	129	127.98	126.02
48	48.95	46.89	89	88.90	86.95	130	128.95	127.00

徑節 (P) 基準 齒輪外徑及節圓徑表



$$P=24$$

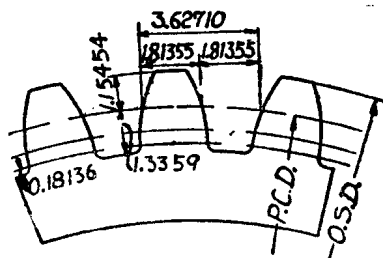
$$M=1.05833$$

$$P.C.D.=M \times N$$

$$O.S.D.=M \times (N+2)$$

齒數 N	節圓徑		齒數 N	節圓徑		齒數 N	節圓徑	
	O.S.D.	P.C.D.		O.S.D.	P.C.D.		O.S.D.	P.C.D.
	mm.	mm.		mm.	mm.		mm.	mm.
8	10.58	8.47	49	53.97	51.83	90	97.37	95.25
9	11.64	9.52	50	55.03	52.92	91	98.42	96.31
10	12.70	10.58	51	56.09	53.97	92	99.48	97.37
11	13.76	11.64	52	57.15	55.03	93	100.54	98.42
12	14.82	12.70	53	58.21	56.09	94	101.60	99.48
13	15.87	13.76	54	59.27	57.15	95	102.66	100.54
14	16.93	14.82	55	60.32	58.21	96	103.72	101.60
15	17.99	15.87	56	61.38	59.27	97	104.77	102.66
16	19.05	16.93	57	62.44	60.32	98	105.83	103.72
17	20.11	17.99	58	63.50	61.38	99	106.89	104.77
18	21.17	19.05	59	64.56	62.44	100	107.95	105.83
19	22.22	20.11	60	65.62	63.50	101	109.01	106.89
20	23.28	21.17	61	66.67	64.56	102	110.07	107.95
21	24.34	22.22	62	67.73	65.62	103	111.12	109.01
22	25.40	23.28	63	68.79	66.67	104	112.18	110.07
23	26.46	24.34	64	69.85	67.73	105	113.24	111.12
24	27.52	25.40	65	70.91	68.79	106	114.30	112.18
25	28.57	26.46	66	71.97	69.85	107	115.36	113.24
26	29.63	27.52	67	73.02	70.91	108	116.42	114.30
27	30.69	28.57	68	74.08	71.97	109	117.47	115.36
28	31.75	29.63	69	75.14	73.02	110	118.53	116.42
29	32.81	30.69	70	76.20	74.08	111	119.59	117.47
30	33.87	31.75	71	77.26	75.14	112	120.65	118.53
31	34.92	32.81	72	78.32	76.20	113	121.71	119.59
32	35.98	33.87	73	79.37	77.26	114	122.77	120.65
33	37.04	34.92	74	80.43	78.32	115	123.82	121.71
34	38.10	35.98	75	81.49	79.37	116	124.88	122.77
35	39.16	37.04	76	82.55	80.43	117	125.94	123.82
36	40.22	38.10	77	83.61	81.49	118	127.00	124.88
37	41.27	39.16	78	84.67	82.55	119	128.06	125.94
38	42.33	40.22	79	85.72	83.61	120	129.12	127.00
39	43.39	41.27	80	86.78	84.67	121	130.17	128.06
40	44.45	42.33	81	87.84	85.72	122	131.23	129.12
41	45.51	43.39	82	88.90	86.78	123	132.29	130.17
42	46.57	44.45	83	89.96	87.84	124	133.35	131.23
43	47.62	45.51	84	91.02	88.90	125	134.41	132.29
44	48.68	46.57	85	92.07	89.96	126	135.47	133.35
45	49.74	47.62	86	93.13	91.02	127	136.52	134.41
46	50.80	48.68	87	94.19	92.07	128	137.58	135.47
47	51.86	49.74	88	95.25	93.13	129	138.64	136.52
48	52.92	50.80	89	96.31	94.19	130	139.70	137.58

徑節 (P) 基準…齒輪外徑及節圓徑表



$$P = 22$$

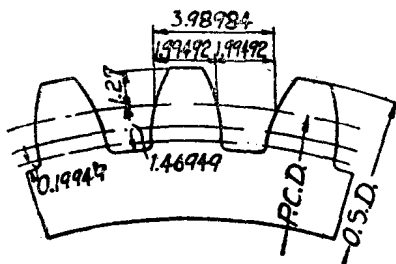
$$M = 1.15454$$

$$P.C.D. = M \times N$$

$$O.S.D. = M \times (N + 2)$$

齒數 N	外 徑	節圓徑	齒數 N	外 徑	節圓徑	齒數 N	外 徑	節圓徑
	O.S.D. mm.	P.C.D. mm.		O.S.D. mm.	P.C.D. mm.		O.S.D. mm.	P.C.D. mm.
8	11.55	9.24	49	58.88	56.57	90	103.22	103.91
9	12.70	10.39	50	60.04	57.73	91	107.37	105.06
10	13.85	11.55	51	61.19	58.88	92	108.53	106.22
11	15.01	12.70	52	62.35	60.04	93	109.68	107.37
12	16.16	13.85	53	63.50	61.19	94	110.84	108.53
13	17.32	15.01	54	64.65	62.35	95	111.99	109.68
14	18.47	16.16	55	65.81	63.50	96	113.14	110.84
15	19.63	17.32	56	66.96	64.65	97	114.30	111.99
16	20.78	18.47	57	68.12	65.81	98	115.45	113.14
17	21.94	19.63	58	69.27	66.96	99	116.61	114.30
18	23.09	20.78	59	70.43	68.12	100	117.76	115.45
19	24.25	21.94	60	71.58	69.27	101	118.92	116.61
20	25.40	23.09	61	72.74	70.43	102	120.07	117.76
21	26.55	24.25	62	73.89	71.58	103	121.23	118.92
22	27.71	25.40	63	75.05	72.74	104	122.38	120.07
23	28.86	26.55	64	76.20	73.89	105	123.54	121.23
24	30.02	27.71	65	77.35	75.05	106	124.69	122.38
25	31.17	28.86	66	78.51	76.20	107	125.84	123.54
26	32.32	30.02	67	79.66	77.35	108	127.00	124.69
27	33.48	31.17	68	80.82	78.51	109	128.15	125.84
28	34.64	32.32	69	81.97	79.66	110	129.31	127.00
29	35.79	33.48	70	83.13	80.82	111	130.46	128.15
30	36.95	34.64	71	84.28	81.97	112	131.62	129.31
31	38.10	35.79	72	85.44	83.13	113	132.77	130.46
32	39.25	36.95	73	86.59	84.28	114	133.93	131.62
33	40.41	38.10	74	87.75	85.44	115	135.08	132.77
34	41.56	39.25	75	88.90	86.59	116	136.24	133.93
35	42.72	40.41	76	90.05	87.75	117	137.39	135.08
36	43.87	41.56	77	91.21	88.90	118	138.54	136.24
37	45.03	42.72	78	92.36	90.05	119	139.70	137.39
38	46.18	43.87	79	93.52	91.21	120	140.85	138.54
39	47.34	45.03	80	94.67	92.36	121	142.01	139.70
40	48.49	46.18	81	95.83	93.52	122	143.16	140.85
41	49.65	47.34	82	96.98	94.67	123	144.32	142.01
42	50.80	48.49	83	98.14	95.83	124	145.47	143.16
43	51.95	49.65	84	99.29	96.98	125	146.63	144.32
44	53.11	50.80	85	100.44	98.14	126	147.78	145.47
45	54.26	51.95	86	101.60	99.29	127	148.94	146.63
46	55.42	53.11	87	102.75	100.44	128	150.09	147.78
47	56.57	54.26	88	103.91	101.60	129	151.24	148.94
48	57.73	55.42	89	105.06	102.75	130	152.40	150.09

徑節 (P) 基準齒輪外徑及節圓徑表



$$P = 20$$

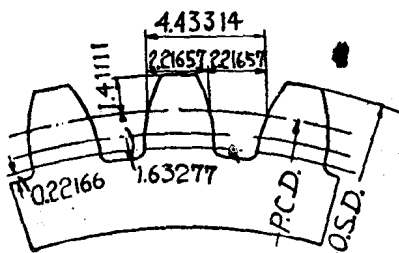
$$M = 1.27000$$

$$P.C.D. = M \times N$$

$$O.S.D. = M \times (N + 2)$$

齒數 N	外徑		齒數 N	外徑		齒數 N	外徑	
	O.S.D.	P.C.D.		O.S.D.	P.C.D.		O.S.D.	P.C.D.
	mm.	mm.		mm.	mm.		mm.	mm.
8	12.70	10.16	49	64.77	62.23	90	116.84	114.30
9	13.97	11.43	50	66.04	63.50	91	118.11	115.57
10	15.24	12.70	51	67.31	64.77	92	119.38	116.84
11	16.51	13.97	52	68.58	66.04	93	120.65	118.11
12	17.78	15.24	53	69.85	67.31	94	121.92	119.38
13	19.05	16.51	54	71.12	68.58	95	123.19	120.65
14	20.32	17.78	55	72.39	69.85	96	124.46	121.92
15	21.59	19.05	56	73.66	71.12	97	125.73	123.19
16	22.86	20.32	57	74.93	72.39	98	127.00	124.46
17	24.13	21.59	58	76.20	73.66	99	128.27	125.73
18	25.40	22.86	59	77.47	74.93	100	129.54	127.00
19	26.67	24.13	60	78.74	76.20	101	130.81	128.27
20	27.94	25.40	61	80.01	77.47	102	132.08	129.54
21	29.21	26.67	62	81.28	78.74	103	133.35	130.81
22	30.48	27.94	63	82.55	80.01	104	134.62	132.08
23	31.75	29.21	64	83.82	81.28	105	135.89	133.35
24	33.02	30.48	65	85.09	82.55	106	137.16	134.62
25	34.29	31.75	66	86.36	83.82	107	138.43	135.89
26	35.56	33.02	67	87.63	85.09	108	139.70	137.16
27	36.83	34.29	68	88.90	86.36	109	140.97	138.43
28	38.10	35.56	69	90.17	87.63	110	142.24	139.70
29	39.37	36.83	70	91.44	88.90	111	143.51	140.97
30	40.64	38.10	71	92.71	90.17	112	144.78	142.24
31	41.91	39.37	72	93.98	91.44	113	146.05	143.51
32	43.18	40.64	73	95.25	92.71	114	147.32	144.78
33	44.45	41.91	74	96.52	93.98	115	148.59	146.05
34	45.72	43.18	75	97.79	95.25	116	149.86	147.32
35	46.99	44.45	76	99.06	96.52	117	151.13	148.59
36	48.26	45.72	77	100.33	97.79	118	152.40	149.86
37	49.53	46.99	78	101.60	99.06	119	153.67	151.13
38	50.80	48.26	79	102.87	100.33	120	154.94	152.40
39	52.07	49.53	80	104.14	101.60	121	156.21	153.67
40	53.34	50.80	81	105.41	102.87	122	157.48	154.94
41	54.61	52.07	82	106.68	104.14	123	158.75	156.21
42	55.88	53.34	83	107.95	105.41	124	160.02	157.48
43	57.15	54.61	84	109.22	106.68	125	161.29	158.75
44	58.42	55.88	85	110.49	107.95	126	162.56	160.02
45	59.69	57.15	86	111.76	109.22	127	163.83	161.29
46	60.96	58.42	87	113.03	110.49	128	165.10	162.56
47	62.23	59.69	88	114.30	111.76	129	166.37	163.83
48	63.50	60.96	89	115.57	113.03	130	167.64	165.10

徑節 (P) 基準…齒輪外徑及節圓徑表



$$P=18$$

$$M=1.41111$$

$$P.C.D.=M \times N$$

$$O.S.D.=M \times (N+2)$$

齒數 N	外徑		齒數 N	外徑		齒數 N	外徑	
	O.S.D.	P.C.D.		O.S.D.	P.C.D.		O.S.D.	P.C.D.
	mm.	mm.		mm.	mm.		mm.	mm.
8	14.11	11.29	49	71.97	69.14	90	129.82	127.00
9	15.52	12.70	50	73.38	70.56	91	131.23	128.41
10	16.93	14.11	51	74.79	71.97	92	132.64	129.82
11	18.34	15.52	52	76.20	73.38	93	134.06	131.23
12	19.76	16.93	53	77.61	74.79	94	135.47	132.64
13	21.17	18.34	54	79.02	76.20	95	136.88	134.06
14	22.58	19.76	55	80.43	77.61	96	138.29	135.47
15	23.99	21.17	56	81.84	79.02	97	139.70	136.88
16	25.40	22.58	57	83.26	80.43	98	141.11	138.29
17	26.81	23.99	58	84.67	81.84	99	142.52	139.70
18	28.22	25.40	59	86.08	83.26	100	143.93	141.11
19	29.63	26.81	60	87.49	84.67	101	145.34	142.52
20	31.04	28.22	61	88.90	86.08	102	146.76	143.93
21	32.46	29.63	62	90.31	87.49	103	148.17	145.34
22	33.87	31.04	63	91.72	88.90	104	149.58	146.76
23	35.28	32.46	64	93.13	90.31	105	150.99	148.17
24	36.69	33.87	65	94.54	91.72	106	152.40	149.58
25	38.10	35.28	66	95.96	93.13	107	153.81	150.99
26	39.51	36.69	67	97.37	94.54	108	155.22	152.40
27	40.92	38.10	68	98.78	95.96	109	156.63	153.81
28	42.33	39.51	69	100.19	97.37	110	158.04	155.22
29	43.74	40.92	70	101.60	98.78	111	159.46	156.63
30	45.16	42.33	71	103.01	100.19	112	160.87	158.04
31	46.57	43.74	72	104.42	101.60	113	162.28	159.46
32	47.98	45.16	73	105.83	103.01	114	163.69	160.87
33	49.39	46.57	74	107.24	104.42	115	165.10	162.28
34	50.80	47.98	75	108.66	105.83	116	166.51	163.69
35	52.21	49.39	76	110.07	107.24	117	167.92	165.10
36	53.62	50.80	77	111.48	108.66	118	169.33	166.51
37	55.03	52.21	78	112.89	110.07	119	170.74	167.92
38	56.44	53.62	79	114.30	111.48	120	172.16	169.33
39	57.86	55.03	80	115.71	112.89	121	173.57	170.74
40	59.27	56.44	81	117.12	114.30	122	174.98	172.16
41	60.68	57.86	82	118.53	115.71	123	176.39	173.57
42	62.09	59.27	83	119.94	117.12	124	177.80	174.98
43	63.50	60.68	84	121.36	118.53	125	179.21	176.39
44	64.91	62.09	85	122.77	119.94	126	180.62	177.80
45	66.32	63.50	86	124.18	121.36	127	182.03	179.21
46	67.73	64.91	87	125.59	122.77	128	183.44	180.62
47	69.14	66.32	88	127.00	124.18	129	184.85	182.03
48	70.56	67.73	89	128.41	125.59	130	186.27	183.44