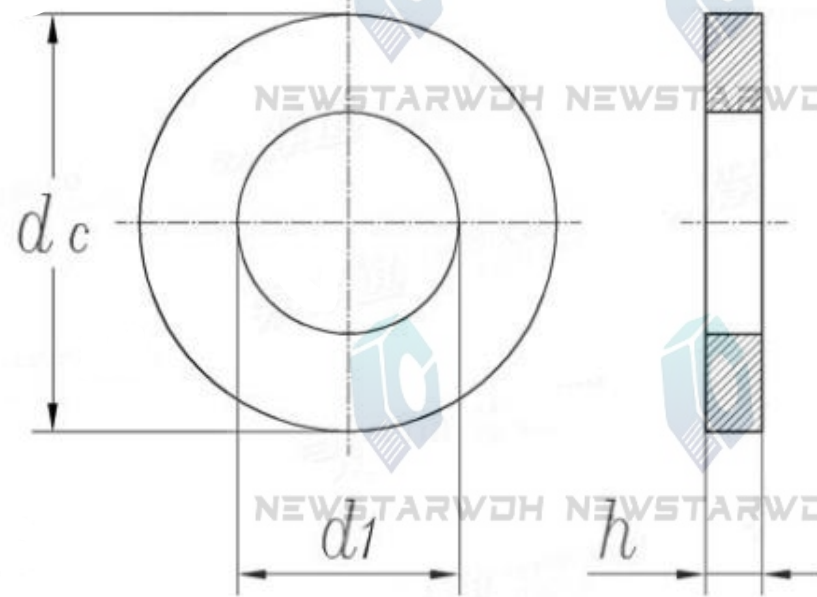


ANSI/ASME B 18.22.1



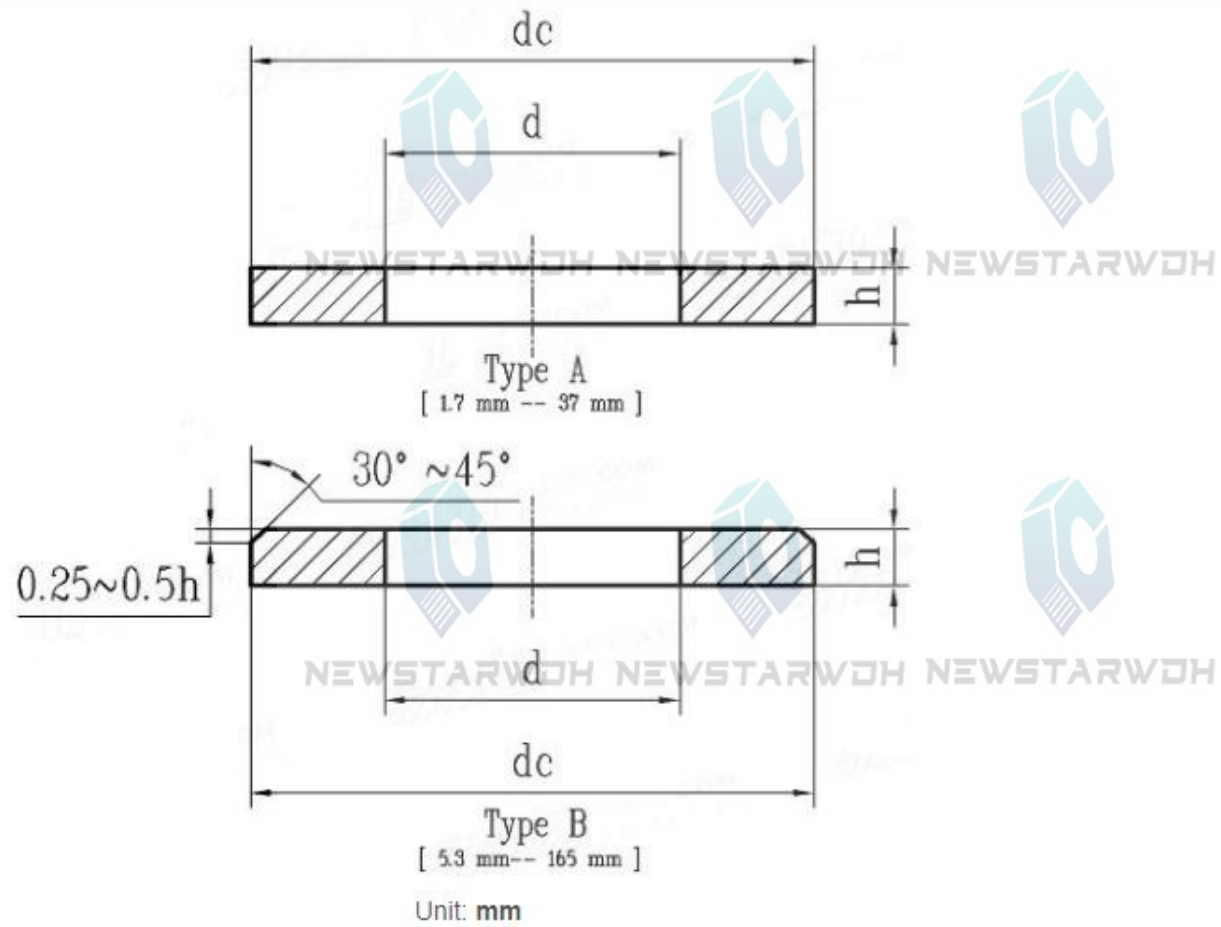
Unit: inch

Nominal Diameter d		-	-	-	6#	8#	10#	3/16	12#	1/4	1/4	5/16	5/16	3/8	3/8	7/16
d	Nominal Size	-	-	-	0.1380	0.1640	0.1900	0.1875	0.2160	0.2500	0.2500	0.3125	0.3125	0.3750	0.3750	0.4375
Series		-	-	-	-	-	-	-	-	N	W	N	W	N	W	N
d₁	Nominal Size	0.078	0.094	0.125	0.156	0.188	0.219	0.250	0.250	0.281	0.312	0.344	0.375	0.406	0.438	0.469
	max	0.078	0.094	0.133	0.164	0.196	0.227	0.265	0.265	0.296	0.327	0.359	0.390	0.421	0.453	0.484
	min	0.073	0.089	0.120	0.151	0.183	0.214	0.245	0.245	0.276	0.307	0.339	0.370	0.401	0.433	0.464
d_c	Nominal Size	0.188	0.250	0.312	0.375	0.438	0.500	0.562	0.562	0.625	0.734*	0.688	0.875	0.812	1.000	0.922
	max	0.188	0.250	0.320	0.390	0.453	0.515	0.577	0.577	0.640	0.749	0.703	0.905	0.827	1.030	0.937
	min	0.183	0.245	0.307	0.370	0.433	0.495	0.557	0.557	0.620	0.727	0.681	0.868	0.805	0.993	0.915
h	Nominal Size	0.020	0.020	0.032	0.049	0.049	0.049	0.049	0.065	0.065	0.065	0.065	0.083	0.065	0.083	0.065
	max	0.025	0.025	0.040	0.065	0.065	0.065	0.065	0.080	0.080	0.080	0.080	0.104	0.080	0.104	0.080
	min	0.016	0.016	0.025	0.036	0.036	0.036	0.036	0.051	0.051	0.051	0.051	0.064	0.051	0.064	0.051

Nominal Diameter d		7/16	1/2	1/2	9/16	9/16	5/8	5/8	3/4	3/4	7/8	7/8	1	1	1-1/8	1-1/8
d	Nominal Size	0.4375	0.5000	0.5000	0.5625	0.5625	0.6250	0.6250	0.7500	0.7500	0.8750	0.8750	1.0000	1.0000	1.1250	1.1250
	Series	W	N	W	N	W	N	W	N	W	N	W	N	W	N	W
d₁	Nominal Size	0.500	0.531	0.562	0.594	0.625	0.656	0.688	0.812	0.812	0.938	0.938	1.062	1.062	1.250	1.250
	max	0.515	0.546	0.577	0.609	0.640	0.686	0.718	0.842	0.842	0.968	0.968	1.092	1.092	1.280	1.280
	min	0.495	0.526	0.557	0.589	0.620	0.649	0.681	0.805	0.805	0.931	0.931	1.055	1.055	1.243	1.243
d_c	Nominal Size	1.250	1.062	1.375	1.156*	1.469*	1.312	1.750	1.469*	2.000	1.750	2.250	2.000	2.500	2.250	2.750
	max	1.280	1.092	1.405	1.186	1.499	1.342	1.780	1.499	2.030	1.780	2.280	2.030	2.530	2.280	2.780
	min	1.243	1.055	1.368	1.149	1.462	1.305	1.743	1.462	1.993	1.743	2.243	1.993	2.493	2.243	2.743
h	Nominal Size	0.083	0.095	0.109	0.095	0.109	0.095	0.134	0.134	0.148	0.134	0.165	0.134	0.165	0.134	0.165
	max	0.104	0.121	0.132	0.121	0.132	0.121	0.160	0.160	0.177	0.160	0.192	0.160	0.192	0.160	0.192
	min	0.064	0.074	0.086	0.074	0.086	0.074	0.108	0.108	0.122	0.108	0.136	0.108	0.136	0.108	0.136

Nominal Diameter d		1-1/4	1-1/4	1-3/8	1-3/8	1-1/2	1-1/2	1-5/8	1-3/4	1-7/8	2	2-1/4	2-1/2	2-3/4	3
d	Nominal Size	1.2500	1.2500	1.3750	1.3750	1.5000	1.5000	1.6250	1.7500	1.8750	2.0000	2.2500	2.5000	2.7500	3.0000
	Series	N	W	N	W	N	W	-	-	-	-	-	-	-	-
d₁	Nominal Size	1.375	1.375	1.500	1.500	1.625	1.625	1.750	1.875	2.000	2.125	2.375	2.625	2.875	3.125
	max	1.405	1.405	1.530	1.545	1.655	1.670	1.795	1.920	2.045	2.170	2.420	2.670	2.940	3.190
	min	1.368	1.368	1.493	1.490	1.618	1.615	1.740	1.865	1.990	2.115	2.365	2.615	2.865	3.115
d_c	Nominal Size	2.500	3.000	2.750	3.250	3.000	3.500	3.750	4.000	4.250	4.500	4.750	5.000	5.250	5.500
	max	2.530	3.030	2.780	3.295	3.030	3.545	3.795	4.045	4.295	4.545	4.795	5.045	5.315	5.565
	min	2.493	2.993	2.743	3.240	2.993	3.490	3.740	3.990	4.240	4.490	4.740	4.990	5.240	5.490
h	Nominal Size	0.165	0.165	0.165	0.180	0.165	0.180	0.180	0.180	0.180	0.180	0.220	0.238	0.259	0.284
	max	0.192	0.192	0.192	0.213	0.192	0.213	0.213	0.213	0.213	0.213	0.248	0.280	0.310	0.327
	min	0.136	0.136	0.136	0.153	0.136	0.153	0.153	0.153	0.153	0.153	0.193	0.210	0.228	0.249

DIN 125



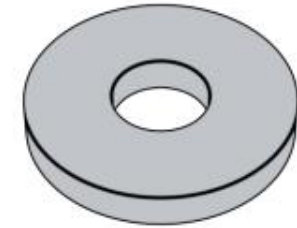
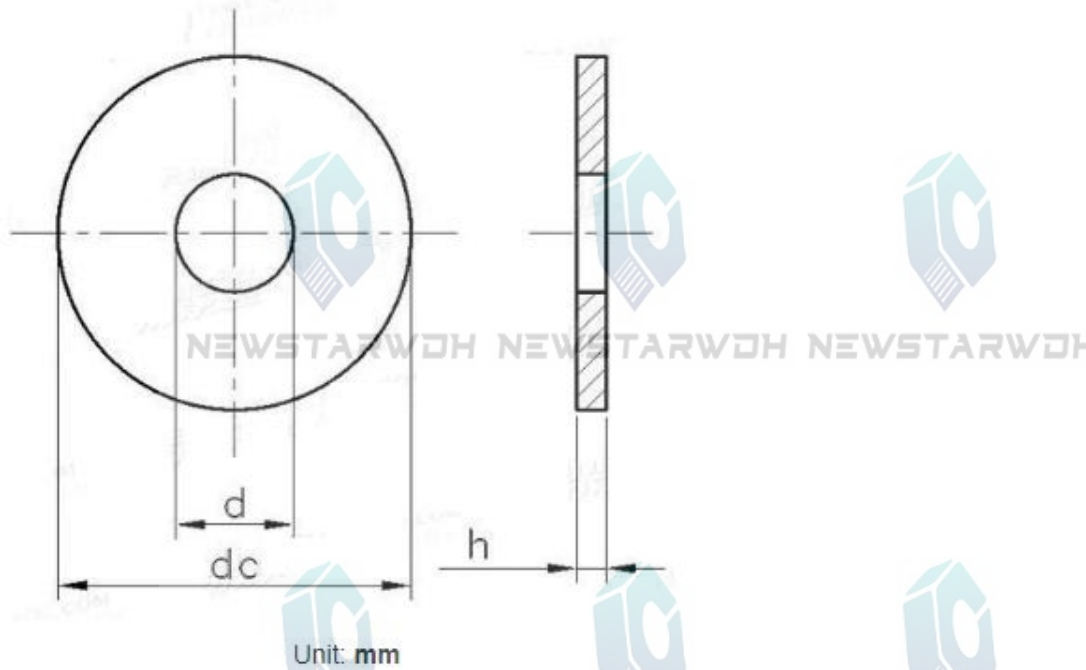
Size		Ø1.7	Ø1.8	Ø2.2	Ø2.5	Ø2.7	Ø2.8	Ø3.2	Ø3.7	Ø4.3	Ø5.3	Ø6.4	Ø7.4	Ø8.4	Ø10.5	Ø13	Ø15
M	For thread size	M1.6	M1.7	M2	M2.3	M2.5	M2.6	M3	M3.5	M4	M5	M6	M7	M8	M10	M12	M14
d	min=nominal size	1.7	1.8	2.2	2.5	2.7	2.8	3.2	3.7	4.3	5.3	6.4	7.4	8.4	10.5	13	15
	max	1.84	1.94	2.34	2.64	2.84	2.94	3.38	3.88	4.48	5.48	6.62	7.62	8.62	10.77	13.27	15.27
d_c	max=nominal size	4	4.5	5	6	6	7	7	8	9	10	12	14	16	20	24	28
	min	3.70	4.20	4.70	5.70	5.70	6.64	6.64	7.64	8.64	9.64	11.57	13.57	15.57	19.48	23.48	27.48
h	Nominal Size	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.8	1	1.6	1.6	1.6	2	2.5	2.5
	max	0.35	0.35	0.35	0.55	0.55	0.55	0.55	0.55	0.9	1.1	1.8	1.8	1.8	2.2	2.7	2.7
	min	0.25	0.25	0.25	0.45	0.45	0.45	0.45	0.45	0.7	0.9	1.4	1.4	1.4	1.8	2.3	2.3
per 1000 units ≈ kg		0.024	0.031	0.037	0.092	0.088	0.127	0.119	0.155	0.308	0.443	1.02	1.39	1.83	3.57	6.27	8.62

Size		Ø17	Ø19	Ø21	Ø23	Ø25	Ø27	Ø28	Ø29	Ø31	Ø33	Ø34	Ø36	Ø37	Ø39	Ø40	Ø41
M	For thread size	M16	M18	M20	M22	M24	M26	M27	M28	M30	M32	M33	M35	M36	M38	M39	M40
d	min=nominal size	17	19	21	23	25	27	28	29	31	33	34	36	37	39	40	41
	max	17.27	19.33	21.33	23.33	25.33	27.33	28.33	29.33	31.39	33.62	34.62	36.62	37.62	39.62	40.62	41.62
d_c	max=nominal size	30	34	37	39	44	50	50	50	56	60	60	66	66	72	72	72
	min	29.48	33.38	36.38	38.38	43.38	49.38	49.38	49.38	55.26	58.80	58.80	64.80	64.80	70.80	70.80	70.80
h	Nominal Size	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6
	max	3.3	3.3	3.3	3.3	4.3	4.3	4.3	4.3	4.3	5.6	5.6	5.6	5.6	6.6	6.6	6.6
	min	2.7	2.7	2.7	2.7	3.7	3.7	3.7	3.7	3.7	4.4	4.4	4.4	4.4	5.4	5.4	5.4
per 1000 units ≈ kg		11.3	14.7	17.2	18.3	32.3	43.7	42.3	40.9	53.6	77.4	75.3	94.3	92.1	136	133	130

Size		Φ43	Φ46	Φ50	Φ52	Φ54	Φ57	Φ58	Φ60	Φ62	Φ66	Φ70	Φ74	Φ78	Φ82	Φ87	Φ93
M	For thread size	M42	M45	M48	M50	M52	M55	M56	M58	M60	M64	M68	M72	M76	M80	M85	M90
d	min=nominal size	43	46	50	52	54	57	58	60	62	66	70	74	78	82	87	93
	max	43.62	46.62	50.62	52.74	54.74	57.74	58.74	60.74	62.74	66.74	70.74	74.74	78.74	82.87	87.87	93.87
d_c	max=nominal size	78	85	92	92	98	105	105	110	110	115	120	125	135	140	145	160
	min	76.80	83.60	90.60	90.60	96.60	103.60	103.60	108.60	108.60	113.60	118.60	123.40	133.40	138.40	143.40	158.40
h	Nominal Size	7	7	8	8	8	9	9	9	9	9	10	10	10	12	12	12
	max	8	8	9	9	9	10	10	10	10	10	11	11	11	13.2	13.2	13.2
	min	6	6	7	7	7	8	8	8	8	8	9	9	9	10.8	10.8	10.8
per 1000 units ≈ kg		183	220	294	284	330	431	425	472	458	492	586	626	749	953	996	1250

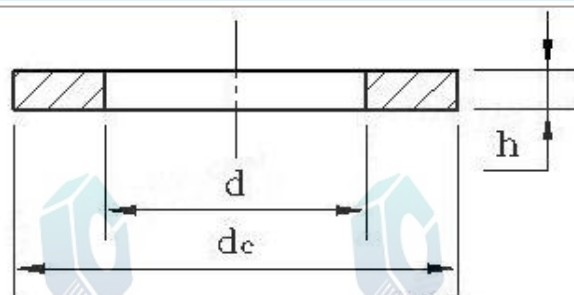
Size		Φ98	Φ104	Φ109	Φ114	Φ119	Φ124	Φ129	Φ134	Φ139	Φ144	Φ149	Φ155	Φ165
M	For thread size	M95	M100	M105	M110	M115	M120	M125	M130	M135	M140	M145	M150	M160
d	min=nominal size	98	104	109	114	119	124	129	134	139	144	149	155	165
	max	98.87	104.87	109.87	114.87	119.87	125	130	135	140	145	150	156	166
d_c	max=nominal size	165	175	180	185	200	210	220	220	230	240	250	250	250
	min	163.40	173.40	178.40	183.15	198.15*	208.15	218.15	218.15	228.15	238.15	248.15	248.15	248.15
h	Nominal Size	12	14	14	14	14	16	16	16	16	18	18	18	18
	max	13.2	15.2	15.2	15.2	15.2	17.2	17.2	17.2	17.2	19.2	19.2	19.2	19.2
	min	10.8	12.8	12.8	12.8	12.8	14.8	14.8	14.8	14.8	16.8	16.8	16.8	16.8
per 1000 units ≈ kg		1300	1710	1770	1830	2230	2830	3130	3000	3310	4090	4470	4270	3910

DIN 7349



Nominal Diameter d	Φ3	Φ4	Φ5	Φ6	Φ8	Φ10	Φ12	Φ14	Φ16	Φ18	Φ20	Φ22	Φ24	Φ27	Φ30
d	3.2	4.3	5.3	6.4	8.4	10.5	13	15	17	19	21	23	25	28	31
dc	9	12	15	17	21	25	30	36	40	44	44	50	50	60	68
h	1	1.6	2	3	4	4	6	6	6	8	8	8	10	10	10
per 1000 units ≈ kg	0.436	1.24	2.43	4.59	9.15	12.7	27.1	39.6	48.5	77.4	73.4	97.1	116	174	226
D Spring Type straight Pins Nominal Diameter	6	8	10	12	16	18	21	25	28	32	35	38	40	45	50

DIN 9021

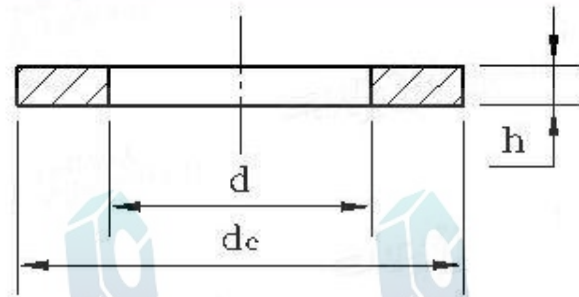


Unit: mm

Nom	d		dc		Nom	h		Weight of per 1000 steel products ≈kg
	max	min	max	min		max	min	
2.5	2.84	2.7	8	7.64	0.8	0.9	0.7	0.28
3	3.38	3.2	9	8.64	0.8	0.9	0.7	0.349
3.5	3.88	3.7	11	10.57	0.8	0.9	0.7	0.529
4	4.48	4.3	12	11.57	1	1.1	0.9	0.774
5	5.48	5.3	15	14.57	1.2	1.4	1	1.46
6	6.62	6.4	18	17.57	1.6	1.8	1.4	2.79
7	7.62	7.4	22	21.48	2	2.2	1.8	5.29
8	8.62	8.4	24	23.48	2	2.2	1.8	6.23
10	10.77	10.5	30	29.48	2.5	2.7	2.3	12.2
12	13.27	13	37	36.38	3	3.3	2.7	22.2
14	15.27	15	44	43.38	3	3.3	2.7	31.6
16	17.27	17	50	49.38	3	3.3	2.7	40.9
18	20.52	20	56	54.1	4	4.6	3.4	67.4
20	22.52	22	60	58.1	4	4.6	3.4	76.8
24	26.84	26	72	70.1	5	6	4	139
30	34	33	92	89.8	6	7	5	273
36	40	39	110	107.8	8	9.2	6.8	522



DIN 440 (R) - 1990

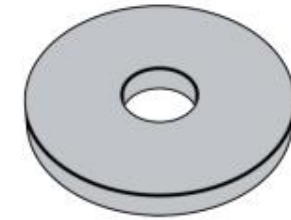
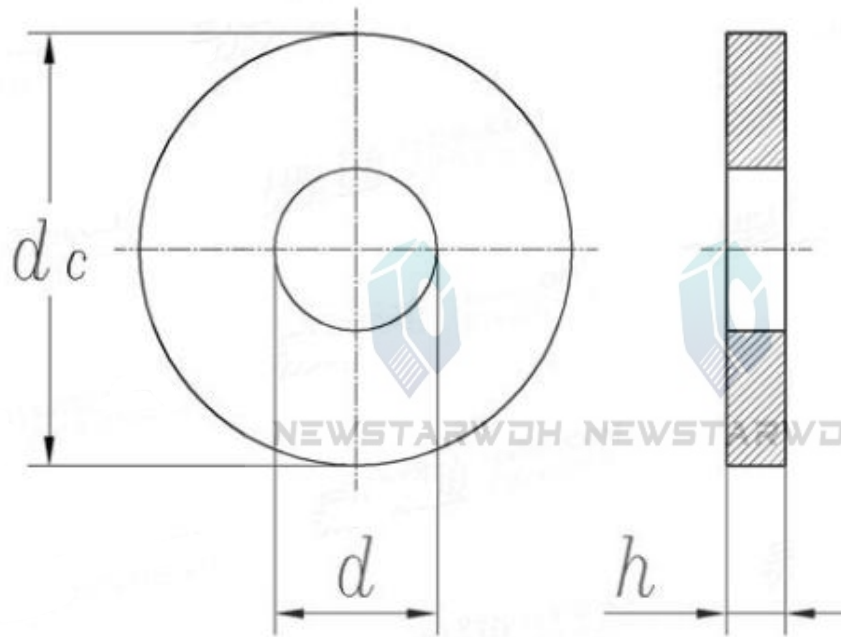


Unit: mm

Nom	d		dc		Nom	h		Weight of per 1000 steel products ≈kg
	max	min	max	min		max	min	
5	5.8	5.5	18	16.9	2	2.3	1.7	3.62
6	6.96	6.6	22	20.7	2	2.3	1.7	5.43
8	9.36	9	28	26.7	3	3.6	2.4	13.0
10	11.43	11	34	32.4	3	3.6	2.4	19.1
12	13.93	13.5	44	42.4	4	4.6	3.4	43.3
14	15.93	15.5	50	48.4	4	4.6	3.4	55.74
16	18.2	17.5	56	54.1	5	6	4	87.2
20	22.84	22	72	70.1	6	7	5	174
22	24.84	24	80	78.1	6	7	5	215
24	26.84	26	85	82.8	6	7	5	242
27	30.84	30	98	95.8	6	7	5	322
30	34	33	105	102.8	6	7	5	368
33	37	36	112	109.8	6	7	5	416
36	40	39	125	122.5	8	9.2	6.8	695
39	43	42	140	137.5	8	9.2	6.8	881
42	46	45	150	147.5	8	9.2	6.8	1010
45	49	48	160	157.5	8	9.2	6.8	1150
48	53.2	52	170	167.5	10	11.2	8.8	1620
52	57.2	56	180	177.5	10	11.2	8.8	1800



JIS B 1256



Unit: mm

Nominal Diameter d		$\Phi 5$	$\Phi 6$	$\Phi 8$	$\Phi 10$	$\Phi 12$	($\Phi 14$)	$\Phi 16$	($\Phi 18$)	$\Phi 20$	($\Phi 22$)	$\Phi 24$	($\Phi 27$)	$\Phi 30$	($\Phi 33$)	$\Phi 36$
d	min	5.5	6.6	9.0	11.0	13.5	15.5	17.5	20.0	22.0	24.0	26.0	30.0	33.0	36.0	39.0
	max	5.8	6.96	9.36	11.43	13.93	15.93	18.2	20.84	22.84	24.84	26.84	30.84	34	37	40
d_c	max	18	22	28	34	44	50	56	60	72	80	85	98	105	115	125
	min	16.9	20.7	26.7	32.4	42.4	48.4	54.1	58.1	70.1	78.1	82.8	95.8	102.8	112.8	122.5
h	Nominal Size	2	2	3	3	4	4	5	5	6	6	6	6	6	8	8
	max	2.3	2.3	3.6	3.6	4.6	4.6	6	6	7	7	7	7	7	9.2	9.2
	min	1.7	1.7	2.4	2.4	3.4	3.4	4	4	5	5	5	5	5	6.8	6.8