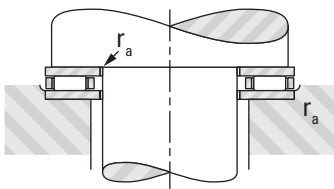
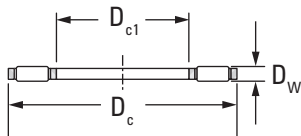
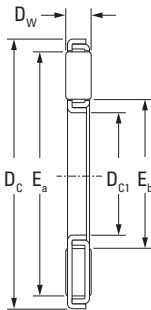
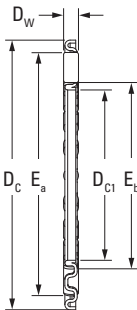


THRUST NEEDLE ROLLER AND CAGE ASSEMBLIES, THRUST WASHERS

METRIC SERIES
AXK, FNT SERIES



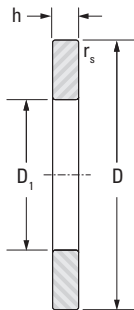
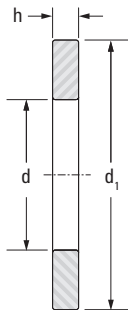
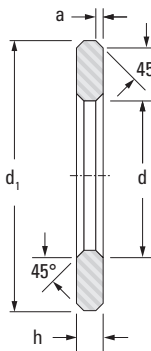
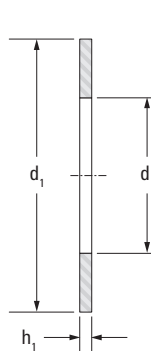
CAGE DESIGN



AXK

FNT

Shaft Dia.	D _{c1}	D _c	D _w	E _a	E _b	r _a max.	Assembly Designation	Load Ratings		Fatigue Load Limit C _u	Speed Rating	Approx. Wt.
								Dynamic	Static		Oil	
								C	C _o			
mm	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min ⁻¹	kg lbs
6	6 0.2362	19 0.7480	2 0.0787	16.9 0.665	7.8 0.307	0.3 0.012	AXK0619TN	6.37 1432	14.3 3215	1.40	23000	0.001 0.002
				18.0 0.709	8.0 0.315	0.3 0.012	FNT-619	6.82 1530	15.6 3510	1.50	21000	0.002 0.004
8	8 0.3150	21 0.8268	2 0.0787	18.6 0.732	9.6 0.378	0.3 0.012	AXK0821TN	8.34 1870	21.1 4740	2.00	20000	0.001 0.002
				20.0 0.787	10.0 0.394	0.3 0.012	FNT-821	7.67 1720	19.1 4290	1.85	20000	0.002 0.004
10	10 0.3937	24 0.9449	2 0.0787	22.5 0.886	11.0 0.433	0.3 0.012	AXK1024	9.32 2100	25.9 5820	2.90	17000	0.003 0.007
				23.0 0.906	12.0 0.472	0.3 0.012	FNT-1024	9.14 2060	25.2 5670	2.40	17000	0.002 0.004
12	12 0.4724	26 1.0236	2 0.0787	24.5 0.965	13.0 0.512	0.3 0.012	AXK1226	10.8 2430	32.3 7260	3.40	15000	0.004 0.009
				25.0 0.984	14.0 0.551	0.3 0.012	FNT-1226	9.92 2230	29.0 6520	2.75	15000	0.004 0.009
15	15 0.5906	28 1.1024	2 0.0787	27.0 1.063	17.0 0.669	0.3 0.012	AXK1528	11.1 2500	35.2 7910	3.35	15000	0.004 0.009
				27.0 1.063	17.0 0.669	0.3 0.012	FNT-1528	10.2 2290	31.3 7040	3.00	15000	0.004 0.009
17	17 0.6693	30 1.1811	2 0.0787	28.7 1.130	18.3 0.721	0.3 0.012	AXK1730TN	11.7 2630	38.7 8700	3.70	14000	0.004 0.009
				29.0 1.142	19.0 0.748	0.3 0.012	FNT-1730	10.8 2430	34.8 7820	3.35	14000	0.004 0.009
20	20 0.7874	35 1.3780	2 0.0787	34.0 1.339	22.0 0.866	0.3 0.012	AXK2035	12.8 2880	45.4 10200	4.40	12000	0.006 0.013
				34.0 1.339	22.0 0.866	0.3 0.012	FNTA-2035	13.8 3100	50.7 11400	4.80	12000	0.005 0.011
25	25 0.9843	42 1.6535	2 0.0787	41.0 1.614	29.0 1.142	0.6 0.024	AXK2542	14.3 3210	56.8 12800	5.50	10000	0.007 0.015
				41.0 1.614	27.0 1.063	0.6 0.024	FNT-2542	18.0 4050	75.3 16900	8.05	9700	0.008 0.018
30	30 1.1811	47 1.8504	2 0.0787	46.0 1.811	35.0 1.378	0.6 0.024	AXK3047	16.0 3600	68.1 15300	6.60	9000	0.009 0.020
				46.0 1.811	32.0 1.260	0.6 0.024	FNTA-3047	18.6 4180	82.4 18500	8.65	8900	0.009 0.020
35	35 1.3780	52 2.0472	2 0.0787	51.0 2.008	40.0 1.575	0.6 0.024	AXK3552	17.4 3910	79.5 17900	7.70	8100	0.010 0.022
				51.0 2.008	37.0 1.457	0.6 0.024	FNT-3552	21.7 4880	104.0 23400	11.1	7900	0.010 0.022



AS
(h₁ = 1.0)

LS

WS.811

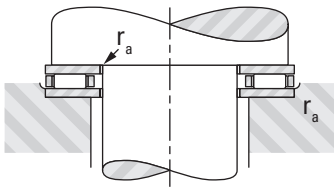
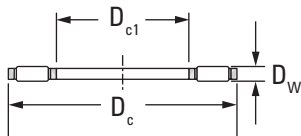
GS.811

Washer Dimensions			Thin			Heavy (LS)				Heavy				
d	D, d ₁	D ₁	h ₁	Washer Designation	Approx. Wt.	h	a	Washer Designation	Approx. Wt.	h	r _s min.	Washer Designation		Approx. Wt.
mm in	mm in	mm in	mm in		kg lbs	mm in	mm in		kg lbs	mm in	mm in	Shaft Piloted	Housing Piloted	kg lbs
6 0.2362	19 0.7480		1.00 0.0394	AS0619	0.001 0.002									
8 0.3150	21 0.8268		1.00 0.0394	AS0821	0.002 0.004	2.75 0.108	0.30 0.012	LS0821	0.004 0.009					
10 0.3937	24 0.9449		1.00 0.0394	AS1024	0.003 0.007	2.75 0.108	0.50 0.020	LS1024	0.008 0.018					
12 0.4724	26 1.0236		1.00 0.0394	AS1226	0.003 0.007	2.75 0.108	0.50 0.020	LS1226	0.009 0.020					
15 0.5906	28 1.1024	16 0.6299	1.00 0.0394	AS1528	0.003 0.007	2.75 0.108	0.50 0.020	LS1528	0.010 0.022	2.75 0.108	0.30 0.012	WS.81102	GS.81102	0.0100 0.0220
17 0.6693	30 1.1811	18 0.7087	1.00 0.0394	AS1730	0.003 0.007	2.75 0.108	0.50 0.020	LS1730	0.011 0.024	2.75 0.108	0.30 0.012	WS.81103	GS.81103	0.011 0.024
20 0.7874	35 1.3780	21 0.8268	1.00 0.0394	AS2035	0.005 0.011	2.75 0.108	0.50 0.020	LS2035	0.014 0.031	2.75 0.108	0.30 0.012	WS.81104	GS.81104	0.014 0.031
25 0.9843	42 1.6535	26 1.0236	1.00 0.0394	AS2542	0.007 0.015	3.00 0.118	1.00 0.039	LS2542	0.021 0.046	3.00 0.118	0.60 0.024	WS.81105	GS.81105	0.021 0.046
30 1.1811	47 1.8504	32 1.2598	1.00 0.0394	AS3047	0.008 0.018	3.00 0.118	1.00 0.039	LS3047	0.023 0.051	3.00 0.118	0.60 0.024	WS.81106	GS.81106	0.023 0.051
35 1.3780	52 2.0472	37 1.4567	1.00 0.0394	AS3552	0.009 0.020	3.50 0.138	1.00 0.039	LS3552	0.030 0.066	3.50 0.138	0.60 0.024	WS.81107	GS.81107	0.032 0.071

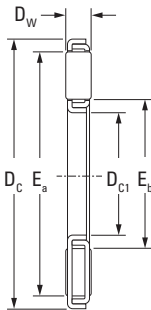
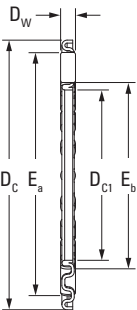
Continued on next page.

THRUST NEEDLE ROLLER AND CAGE ASSEMBLIES, THRUST WASHERS

METRIC SERIES
AXK, FNT SERIES



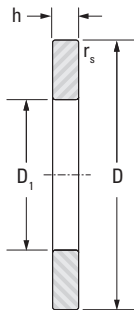
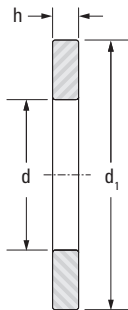
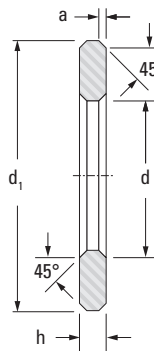
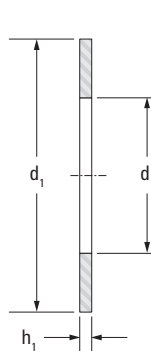
CAGE DESIGN



AXK

FNT

Shaft Dia.	D _{c1}	D _c	D _w	E _a	E _b	r _a max.	Assembly Designation	Load Ratings		Fatigue Load Limit C _u	Speed Rating	Approx. Wt.
								Dynamic	Static		Oil	
								C	C _o			
mm	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min ⁻¹	kg lbs
40	40 1.5748	60 2.3622	3 0.1181	58.0 2.283	45.0 1.772	0.6 0.024	AXK4060	27.1 6090	110.0 24700	11.9	7000	0.016 0.035
				57.0 2.244	43.0 1.693	0.6 0.024	FNT-4060	31.5 7080	132.0 29700	14.6	7100	0.020 0.044
45	45 1.7717	65 2.5591	3 0.1181	63.0 2.480	50.0 1.969	0.6 0.024	AXK4565	29.0 6520	124.0 27900	13.4	6500	0.020 0.044
				63.0 2.480	47.0 1.850	0.6 0.024	FNT-4565	37.6 8450	172.0 38700	18.5	6400	0.024 0.053
50	50 1.9685	70 2.7559	3 0.1181	68.0 2.677	55.0 2.165	0.6 0.024	AXK5070	30.8 6920	137.0 30800	14.9	6000	0.020 0.044
				68.0 2.677	52.0 2.047	0.6 0.024	FNT-5070	37.9 8520	179.0 40200	19.1	5900	0.026 0.057
55	55 2.1654	78 3.0709	3 0.1181	76.0 2.992	60.0 2.362	0.6 0.024	AXK5578	39.4 8860	195.0 43800	20.5	5300	0.026 0.057
				76.0 2.992	57.0 2.244	0.6 0.024	FNT-5578	48.5 10900	254.0 57100	26.3	5300	0.033 0.073
60	60 2.3622	85 3.3465	3 0.1181	83.0 3.268	65.0 2.559	0.6 0.024	AXK6085	44.5 10000	234.0 52600	24.7	4900	0.035 0.077
65	65 2.5591	90 3.5433	3 0.1181	88.0 3.465	70.0 2.756	0.6 0.024	AXK6590	46.7 10500	254 57100	26.8	4600	0.036 0.079
70	70 2.7559	95 3.7402	4 0.1575	93.0 3.661	74.0 2.913	0.6 0.024	AXK7095	53.8 12100	253 56900	28.0	4400	0.055 0.121
				93.0 3.661	73.0 2.874	0.6 0.024	FNTA-7095	66.6 15000	333 74900	35.3	4400	0.057 0.126
75	75 2.9528	100 3.9370	4 0.1575	98.0 3.858	79.0 3.110	0.6 0.024	AXK75100	55.1 12400	266 59800	29.4	4200	0.058 0.128
				98.0 3.858	78.0 3.071	0.6 0.024	FNT-75100	71.6 16100	374 84100	39.7	4100	0.064 0.141
80	80 3.1496	105 4.1339	4 0.1575	103.0 4.055	84.0 3.307	0.6 0.024	AXK80105	56.4 12700	279 62700	30.8	4000	0.092 0.203
				103.0 4.055	83.0 3.268	0.6 0.024	FNTA-80105	71.3 16100	379 85200	40.1	3900	0.062 0.137
85	85 3.3465	110 4.3307	4 0.1575	108.0 4.252	89.0 3.504	0.6 0.024	AXK85110	57.6 12900	291 65400	32.2	3800	0.063 0.139
90	90 3.5433	120 4.7244	4 0.1575	118.0 4.646	94.0 3.701	0.6 0.024	AXK90120	72.9 16400	405 91000	43.0	3500	0.081 0.179
100	100 3.9370	135 5.3150	4 0.1575	133.0 5.236	105.0 4.134	0.6 0.024	AXK100135	90.2 20300	552 124000	56.4	3100	0.106 0.234
110	110 4.3307	145 5.7087	4 0.1575	143.0 5.630	115.0 4.528	0.6 0.024	AXK110145	93.2 21000	591 133000	59.0	2800	0.117 0.258



AS
(h₁ = 1.0)

LS

WS.811

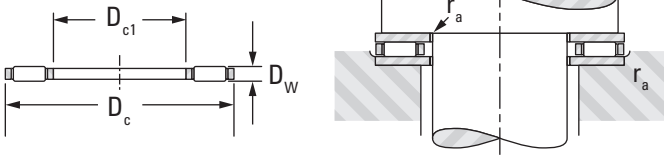
GS.811

Washer Dimensions			Thin			Heavy (LS)				Heavy				
d	D, d ₁	D ₁	h ₁	Washer Designation	Approx. Wt.	h	a	Washer Designation	Approx. Wt.	h	r _s min.	Washer Designation		Approx. Wt.
mm in	mm in	mm in	mm in		kg lbs	mm in	mm in		kg lbs	mm in	mm in	Shaft Piloted	Housing Piloted	kg lbs
40 1.5748	60 2.3622	42 1.6535	1.00 0.0394	AS4060	0.012 0.026	3.50 0.138	1.00 0.039	LS4060	0.041 0.090	3.50 0.138	0.60 0.024	WS.81108	GS.81108	0.043 0.095
45 1.7717	65 2.5591	47 1.8504	1.00 0.0394	AS4565	0.013 0.029	4.00 0.157	1.00 0.039	LS4565	0.052 0.115	4.00 0.157	0.60 0.024	WS.81109	GS.81109	0.054 0.119
50 1.9685	70 2.7559	52 2.0472	1.00 0.0394	AS5070	0.014 0.031	4.00 0.157	1.00 0.039	LS5070	0.0560 0.1230	4.00 0.157	0.60 0.024	WS.81110	GS.81110	0.059 0.130
55 2.1654	78 3.0709	57 2.2441	1.00 0.0394	AS5578	0.018 0.040	5.00 0.197	1.00 0.039	LS5578	0.0910 0.2010	5.00 0.197	0.60 0.024	WS.81111	GS.81111	0.094 0.207
60 2.3622	85 3.3465	62 2.4409	1.00 0.0394	AS6085	0.022 0.049	4.75 0.187	1.50 0.059	LS6085	0.102 0.225	4.75 0.187	1.00 0.039	WS.81112	GS.81112	0.106 0.234
65 2.5591	90 3.5433	67 2.6378	1.00 0.0394	AS6590	0.023 0.051	5.25 0.207	1.50 0.059	LS6590	0.121 0.267	5.25 0.207	1.00 0.039	WS.81113	GS.81113	0.125 0.276
70 2.7559	95 3.7402	72 2.8346	1.00 0.0394	AS7095	0.025 0.055	5.25 0.207	1.50 0.059	LS7095	0.1280 0.2820	5.25 0.207	1.00 0.039	WS.81114	GS.81114	0.133 0.293
75 2.9528	100 3.9370	77 3.0315	1.00 0.0394	AS75100	0.027 0.060	5.75 0.226	1.50 0.059	LS75100	0.1500 0.3310	5.75 0.226	1.00 0.039	WS.81115	GS.81115	0.155 0.342
80 3.1496	105 4.1339	82 3.2283	1.00 0.0394	AS80105	0.028 0.062	5.75 0.226	1.50 0.059	LS80105	0.1580 0.3480	5.75 0.226	1.00 0.039	WS.81116	GS.81116	0.165 0.364
85 3.3465	110 4.3307	87 3.4252	1.00 0.0394	AS85110	0.028 0.062	5.75 0.226	1.50 0.059	LS85110	0.166 0.366	5.75 0.226	1.00 0.039	WS.81117	GS.81117	0.173 0.381
90 3.5433	120 4.7244	92 3.6220	1.00 0.0394	AS90120	0.038 0.084	6.50 0.256	1.50 0.059	LS90120	0.245 0.540	6.50 0.256	1.00 0.039	WS.81118	GS.81118	0.253 0.558
100 3.9370	135 5.3150		1.00 0.0394	AS100135	0.050 0.110									
110 4.3307	145 5.7087		1.00 0.0394	AS110145	0.055 0.121	7.00 0.276	1.50 0.059	LS110145	0.373 0.822	7.00 0.276				

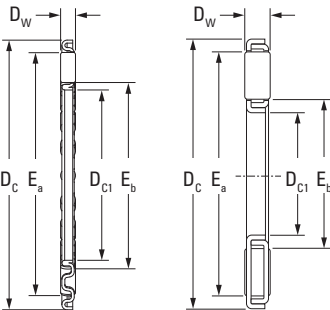
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THRUST NEEDLE ROLLER AND CAGE ASSEMBLIES, THRUST WASHERS

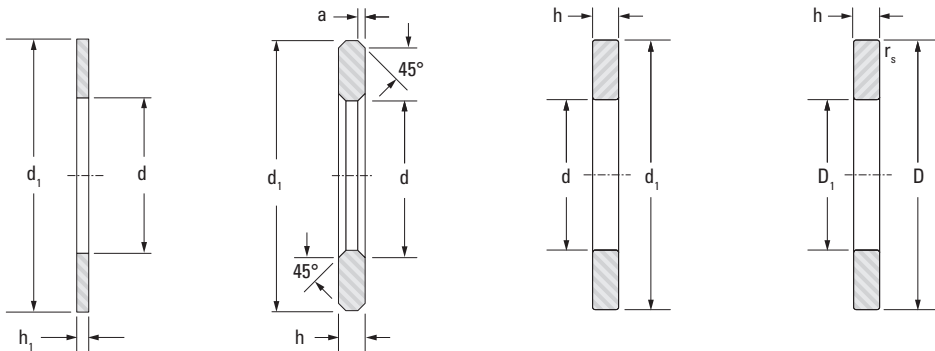
METRIC SERIES
AXK, FNT SERIES



CAGE DESIGN



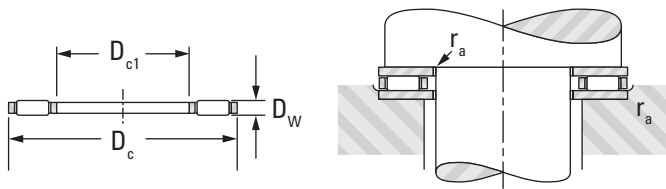
Shaft Dia.	D _{c1}	D _c	D _w	E _a	E _b	r _a max.	Assembly Designation	Load Ratings		Fatigue Load Limit C _u	Speed Rating	Approx. Wt.
								Dynamic	Static			
								C	C _o		Oil	
mm	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min ⁻¹	kg lbs
120	120 4.7244	155 6.1024	4 0.1575	153.0 6.024	125.0 4.921	0.6 0.024	AXK120155	98.5 22100	650 146000	63.5	2700	0.126 0.278
130	130 5.1181	170 6.6929	5 0.1969	167.0 6.575	136.0 5.354	0.6 0.024	AXK130170	132 29700	829 186000	78.7	2400	0.198 0.437
140	140 5.5118	180 7.0866	5 0.1969	177.0 6.969	146.0 5.748	0.6 0.024	AXK140180	136 30600	887 199000	82.5	2300	0.221 0.487
150	150 5.9055	190 7.4803	5 0.1969	187.0 7.362	156.0 6.142	0.6 0.024	AXK150190	141 31700	944 212000	86.2	2200	0.225 0.496
160	160 6.2992	200 7.8740	5 0.1969	197.0 7.756	166.0 6.535	0.6 0.024	AXK160200	146 32800	1000 225000	89.9	2100	0.249 0.549



AS (h ₁ = 1.0)						LS		WS.811		GS.811				
Washer Dimensions			Thin			Heavy (LS)				Heavy				
d	D, d ₁	D ₁	h ₁	Washer Designation	Approx. Wt.	h	a	Washer Designation	Approx. Wt.	h	r _s min.	Washer Designation		Approx. Wt.
												Shaft Piloted	Housing Piloted	
mm in	mm in	mm in	mm in		kg lbs	mm in	mm in		kg lbs	mm in	mm in			kg lbs
120 4.7244	155 6.1024		1.00 0.0394	AS120155	0.059 0.130									
130 5.1181	170 6.6929		1.00 0.0394	AS130170	0.074 0.163	9.00 0.354	1.50 0.059	LS130170	0.649 1.431					
140 5.5118	180 7.0866		1.00 0.0394	AS140180	0.078 0.172									
150 5.9055	190 7.4803		1.00 0.0394	AS150190	0.083 0.183									
160 6.2992	200 7.8740		1.00 0.0394	AS160200	0.089 0.196									

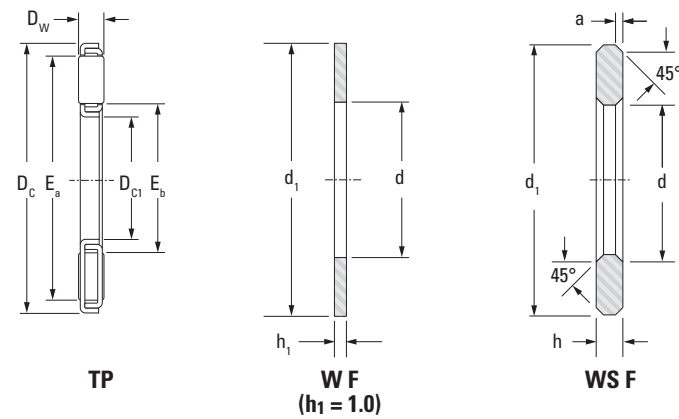
THRUST NEEDLE ROLLER AND CAGE ASSEMBLIES, THRUST WASHERS

METRIC SERIES
TP SERIES



Shaft Dia.	D _{c1}	D _c	D _w	E _a	E _b	r _a max.	Assembly Designation	Load Ratings		Fatigue Load Limit C _u	Speed Rating	Approx. Wt.
								Dynamic	Static			
								C	C ₀		Oil	
mm	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min ⁻¹	kg lbs
15	15	32.3	2	31	22		TP1532-1	12.7	44.7	4.50	13000	0.006
18	18	31	2	29	20		TP1831	10.6	34.4	3.30	14000	0.005
20	20	34.72	2	32	22		TP2035	15.3	57.4	5.70	12000	0.006
20.9	20.9	32	2	30	23		TP2132D	9.20	29.7	2.85	13000	0.005
21.9	21.9	34	2	32	25		TP2234	8.85	28.6	2.75	13000	0.005
25	25	42	2	40	28		TP2542	16.2	66.2	6.90	10000	0.009
30	30	47	2	45	34		TP3047-1	17.9	78.6	8.20	9000	0.010
33.49	33.49	45.13	2	43	37		TP3445A	9.35	34.3	4.85	9000	0.007
39.6	39.6	58.24	3	56	43		TP4058-1	29.2	120	12.9	7000	0.022
41	41	68.05	9	64	45		TP4168	86.6	233	26.5	6000	0.104
42	42	62	3	57	47		TP4262	19.3	71.4	7.00	7000	0.023
45	45	56	2	54	47		TP4556	9.90	39.6	3.80	7000	0.008
46.4	46.4	68	3.5	65	49		TP4668-2	42.2	182	19.3	6000	0.035
50	50	70	3	66	54		TP5070	29.4	129	14.2	6000	0.028
70	70	95	4	91	74		TP7095	57.3	275	29.2	4000	0.070

CAGE DESIGN



Washer Dimensions			Thin			Heavy (WS)				Heavy				
d	D, d ₁	D ₁	h ₁	Washer Designation	Approx. Wt.	h	a	Washer Designation	Approx. Wt.	h	r _s min.	Washer Designation		Approx. Wt.
												Shaft Piloted	Housing Piloted	
mm in	mm in	mm in	mm in		kg lbs	mm in	mm in		kg lbs	mm in	mm in			kg lbs
15	32		1.00	W1532F	0.005									
18	31		1.00	W1831F	0.004									
25	42		1.00	W2542F	0.007	3.00		WS2542KF	0.021					
70	95					3.00		WS7095F	0.075					