

CURVED SPRINGS WASHERS

Precision engineered curved washers are available from Associated Spring Raymond in many stock sizes. These washers are made of finely tempered spring steel with some sizes being made of stainless steel. They come deburred and we have had all set removed during manufacture. Curved washers exert relatively light thrust loads and are often used to absorb axial end play.

The rate is approximately linear between 10% and 80% of available deflection.

Finish

Standard finish for high carbon steel is plain finish. Stainless steel is supplied in plain finish. On special order, high carbon steel washers may be mechanically plated, a process which substantially reduces the possibility of hydrogen embrittlement. Recommendations for specific applications will be made on request.

Material

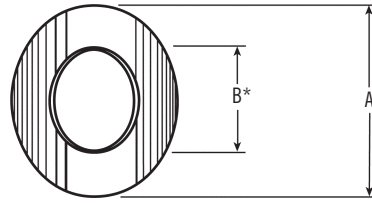
Stainless Steel (Parts with suffix "S")

Commercial - Type 301 per ASTM-A666 (chemical only).

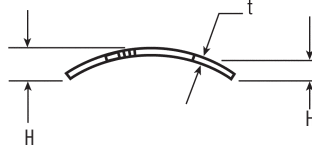
High Carbon Steel

Commercial - 1074-1095 per ASTM-A684

Certificate of compliance available upon request - Certificate of chemical analysis available at extra cost.



* This is the long axis of the hole in the free position, providing a free fit on the nominal size screw or rod.



A = Outside Diameter (max)

B = Inside Diameter

t = Thickness

H = Free Height (ref)

H₁ = Loaded Height

P₁ = Load at H₁

CURVED SPRINGS WASHERS																	
Catalog Number*	Free Fit Screw or Rod Size			Min B		Max A		Free fit in hole dia.		H (ref.)		H ₁		Load at H ₁ ± 20% (P ₁)		Thickness (t)	
	in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	N	in	mm
U093-0045-S	3/32	0.093	2.36	0.100	2.54	0.215	5.46	7/32	0.2187	0.028	0.71	0.015	0.38	1.5	6.67	0.0045	0.11
U093-0056-S	3/32	0.093	2.36	0.100	2.54	0.215	5.46	7/32	0.2187	0.025	0.64	0.015	0.38	2.25	10.01	0.0056	0.14
U125-0040-S	5	0.125	3.18	0.135	3.43	0.245	6.22	1/4	0.25	0.049	1.24	0.026	0.66	1.0	4.45	0.004	0.10
U125-0060-S	5	0.125	3.18	0.135	3.43	0.245	6.22	1/4	0.25	0.034	0.86	0.020	0.51	2.00	8.90	0.006	0.15
U125-0050-S	5	0.125	3.18	0.135	3.43	0.270	6.86	9/32	0.2812	0.038	0.97	0.020	0.51	1.5	6.67	0.005	0.13
U125-0075-S	5	0.125	3.18	0.135	3.43	0.270	6.86	9/32	0.2812	0.029	0.74	0.018	0.46	3.0	13.34	0.0075	0.19
U125-0072-S	5	0.125	3.18	0.135	3.43	0.307	7.80	5/16	0.3125	0.037	0.94	0.020	0.51	4.0	17.80	0.0072	0.18
U125-0088-S	5	0.125	3.18	0.135	3.43	0.307	7.80	5/16	0.3125	0.034	0.86	0.020	0.51	6.0	26.7	0.0088	0.22
U138-0045-S	6	0.138	3.51	0.148	3.76	0.270	6.89	9/32	0.2812	0.052	1.32	0.028	0.71	1.25	5.56	0.0045	0.11
U138-0070-S	6	0.138	3.51	0.148	3.76	0.270	6.89	9/32	0.2812	0.035	0.89	0.022	0.56	2.5	11.12	0.007	0.18
U138-0082-S	6	0.138	3.51	0.148	3.76	0.322	8.18	11/32	0.3437	0.037	0.94	0.021	0.53	5.0	22.2	0.0082	0.21
U138-0100-S	6	0.138	3.51	0.148	3.76	0.322	8.18	11/32	0.3437	0.034	0.86	0.021	0.53	7.5	33.4	0.01	0.25
U164-0050-S	8	0.164	4.17	0.174	4.42	0.322	8.18	11/32	0.3437	0.064	1.63	0.034	0.86	1.5	6.67	0.005	0.13
U164-0075-S	8	0.164	4.17	0.174	4.42	0.322	8.18	11/32	0.3437	0.042	1.07	0.025	0.64	3.0	13.34	0.0075	0.19
U164-0090-S	8	0.164	4.17	0.174	4.42	0.370	9.40	3/8	0.375	0.044	1.12	0.024	0.61	6.0	26.7	0.009	0.23
U164-0113	8	0.164	4.17	0.174	4.42	0.370	9.40	3/8	0.375	0.039	0.99	0.024	0.61	9.0	40.0	0.0113	0.29
U164-0113-S	8	0.164	4.17	0.174	4.42	0.370	9.40	3/8	0.375	0.039	0.99	0.024	0.61	9.0	40.0	0.0113	0.29
U190-0050-S	10	0.190	4.83	0.203	5.16	0.322	8.18	11/32	0.3437	0.053	1.35	0.026	0.66	1.12	4.98	0.005	0.13
U190-0065-S	10	0.190	4.83	0.203	5.16	0.322	8.18	11/32	0.3437	0.043	1.09	0.025	0.64	1.75	7.79	0.0065	0.17
U190-0060-S	10	0.190	4.83	0.200	5.08	0.370	9.40	3/8	0.375	0.069	1.75	0.035	0.89	2.25	10.01	0.006	0.15
U190-0090-S	10	0.190	4.83	0.200	5.08	0.370	9.40	3/8	0.375	0.047	1.19	0.028	0.71	4.5	20.0	0.009	0.23
U190-0113	10	0.190	4.83	0.200	5.08	0.423	10.74	7/16	0.4375	0.047	1.19	0.027	0.69	9.0	40.0	0.0113	0.29
U190-0113-S	10	0.190	4.83	0.200	5.08	0.423	10.74	7/16	0.4375	0.047	1.19	0.027	0.69	9.0	40.0	0.0113	0.29
U190-0140	10	0.190	4.83	0.200	5.08	0.423	10.74	7/16	0.4375	0.043	1.09	0.027	0.69	13.5	60.1	0.014	0.36
U216-0065-S	12	0.216	5.49	0.231	5.87	0.423	10.74	7/16	0.4375	0.081	2.06	0.042	1.07	2.5	11.12	0.0065	0.17
U216-0100-S	12	0.216	5.49	0.231	5.87	0.423	10.74	7/16	0.4375	0.053	1.35	0.032	0.81	5.0	22.2	0.01	0.25
U216-0120	12	0.216	5.49	0.231	5.87	0.490	12.45	1/2	0.5	0.057	1.45	0.032	0.81	10.0	44.5	0.012	0.30
U216-0150	12	0.216	5.49	0.231	5.87	0.490	12.45	1/2	0.5	0.050	1.27	0.032	0.81	15.0	66.7	0.015	0.38
U250-0065-S	1/4	0.250	6.35	0.269	6.83	0.423	10.74	7/16	0.4375	0.070	1.78	0.037	0.94	1.75	7.78	0.0065	0.17
U250-0082-S	1/4	0.250	6.35	0.269	6.83	0.423	10.74	7/16	0.4375	0.055	1.40	0.032	0.81	2.5	11.12	0.0082	0.21
U250-0075-S	1/4	0.250	6.35	0.265	6.73	0.490	12.45	1/2	0.5	0.091	2.31	0.046	1.17	3.5	15.57	0.0075	0.19
U250-0110	1/4	0.250	6.35	0.265	6.73	0.490	12.45	1/2	0.5	0.063	1.60	0.034	0.86	7.0	31.1	0.011	0.28
U250-0110-S	1/4	0.250	6.35	0.265	6.73	0.490	12.45	1/2	0.5	0.063	1.60	0.034	0.86	7.0	31.1	0.011	0.28
U250-0145	1/4	0.250	6.35	0.265	6.73	0.551	14.00	9/16	0.5625	0.060	1.52	0.034	0.86	14.0	62.3	0.0145	0.37

* Numbers with the suffix "S" are stainless steel.



CURVED SPRINGS WASHERS

Catalog Number*	Free Fit Screw or Rod Size			Min B		Max A		Free fit in hole dia.		H (ref.)		H ₁		Load at H ₁ ± 20% (P ₂)		Thickness (t)	
	in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	N	in	mm
U250-0185	1/4	0.250	6.35	0.265	6.73	0.551	14.00	9/16	0.5625	0.052	1.32	0.034	0.86	21.0	93.4	0.0185	0.47
U250-0185-S	1/4	0.250	6.35	0.265	6.73	0.551	14.00	9/16	0.5625	0.052	1.32	0.034	0.86	21.0	93.4	0.0185	0.47
U281-0085-S	9/32	0.281	7.14	0.296	7.52	0.551	14.00	9/16	0.5625	0.101	2.57	0.055	1.40	4.0	17.80	0.0085	0.22
U281-0120	9/32	0.281	7.14	0.296	7.52	0.551	14.00	9/16	0.5625	0.070	1.78	0.038	0.97	8.0	35.6	0.012	0.30
U312-0075-S	5/16	0.312	7.92	0.331	8.41	0.490	12.45	1/2	0.5	0.077	1.96	0.041	1.04	2.25	10.01	0.0075	0.19
U312-0110	5/16	0.312	7.92	0.331	8.41	0.490	12.45	1/2	0.5	0.062	1.57	0.035	0.89	4.5	20.0	0.011	0.28
U312-0110-S	5/16	0.312	7.92	0.331	8.41	0.490	12.45	1/2	0.5	0.062	1.57	0.035	0.89	4.5	20.0	0.011	0.28
U312-0090-S	5/16	0.312	7.92	0.327	8.31	0.612	15.54	5/8	0.625	0.113	2.87	0.060	1.52	4.5	20.0	0.009	0.23
U312-0130	5/16	0.312	7.92	0.327	8.31	0.612	15.54	5/8	0.625	0.077	1.96	0.042	1.07	9.0	40.0	0.013	0.33
U312-0130-S	5/16	0.312	7.92	0.327	8.31	0.612	15.54	5/8	0.625	0.077	1.96	0.042	1.07	9.0	40.0	0.013	0.33
U312-0170	5/16	0.312	7.92	0.327	8.31	0.735	18.67	3/4	0.75	0.076	1.93	0.046	1.17	15.0	66.7	0.017	0.43
U312-0210	5/16	0.312	7.92	0.327	8.31	0.735	18.67	3/4	0.75	0.070	1.78	0.045	1.14	22.5	100.1	0.021	0.53
U343-0100-S	11/32	0.343	8.71	0.363	9.22	0.672	17.07	11/16	0.6875	0.120	3.05	0.063	1.60	5.5	24.5	0.01	0.25
U343-0150	11/32	0.343	8.71	0.363	9.22	0.672	17.07	11/16	0.6875	0.081	2.06	0.047	1.19	11.0	48.9	0.015	0.38
U375-0090-S	3/8	0.375	9.53	0.400	10.16	0.612	15.45	5/8	0.625	0.098	2.49	0.056	1.42	3.0	13.34	0.009	0.23
U375-0130	3/8	0.375	9.53	0.400	10.16	0.612	15.45	5/8	0.625	0.074	1.88	0.043	1.09	6.0	26.7	0.013	0.33
U375-0100-S	3/8	0.375	9.53	0.400	10.16	0.672	17.07	11/16	0.6875	0.115	2.92	0.059	1.50	4.5	20.0	0.01	0.25
U375-0150	3/8	0.375	9.53	0.400	10.16	0.672	17.07	11/16	0.6875	0.079	2.01	0.046	1.17	9.0	40.0	0.015	0.38
U375-0110	3/8	0.375	9.53	0.395	10.03	0.735	18.67	3/4	0.75	0.129	3.28	0.073	1.85	6.0	26.7	0.011	0.28
U375-0110-S	3/8	0.375	9.53	0.395	10.03	0.735	18.67	3/4	0.75	0.129	3.28	0.073	1.85	6.0	26.7	0.011	0.28
U375-0160	3/8	0.375	9.53	0.395	10.03	0.735	18.67	3/4	0.75	0.086	2.18	0.050	1.27	12.0	53.4	0.016	0.41
U375-0160-S	3/8	0.375	9.53	0.395	10.03	0.735	18.67	3/4	0.75	0.086	2.18	0.050	1.27	12.0	53.4	0.016	0.41
U437-0100-S	7/16	0.437	11.10	0.467	11.86	0.672	17.07	11/16	0.6875	0.115	2.92	0.060	1.52	3.75	16.68	0.01	0.25
U437-0150	7/16	0.437	11.10	0.467	11.86	0.672	17.07	11/16	0.687	0.084	2.13	0.045	1.14	7.5	33.4	0.015	0.38
U437-0150-S	7/16	0.437	11.10	0.467	11.86	0.672	17.07	11/16	0.687	0.084	2.13	0.045	1.14	7.5	33.4	0.015	0.38
U437-0120	7/16	0.437	11.10	0.462	11.73	0.857	21.77	7/8	0.875	0.152	3.86	0.079	2.01	7.5	33.4	0.012	0.30
U437-0180	7/16	0.437	11.10	0.462	11.73	0.857	21.77	7/8	0.875	0.100	2.54	0.057	1.45	15.0	66.7	0.018	0.46
U437-0180-S	7/16	0.437	11.10	0.462	11.73	0.857	21.77	7/8	0.875	0.100	2.54	0.057	1.45	15.0	66.7	0.018	0.46
U437-0210	7/16	0.437	11.10	0.462	11.73	0.980	24.89	1	0.98	0.107	2.72	0.061	1.55	22.5	100.1	0.021	0.53
U500-0113	1/2	0.500	12.70	0.531	13.48	0.795	20.20	13/16	0.8125	0.129	3.28	0.069	1.75	5.0	22.2	0.0113	0.29
U500-0170	1/2	0.500	12.70	0.531	13.48	0.795	20.20	13/16	0.8125	0.098	2.49	0.054	1.37	10.0	44.5	0.017	0.43
U500-0140	1/2	0.500	12.70	0.525	13.34	0.980	24.89	1	0.98	0.164	4.17	0.083	2.11	10.0	44.5	0.014	0.36
U500-0180	1/2	0.500	12.70	0.525	13.34	0.980	24.89	1	0.98	0.131	3.33	0.073	1.85	15.0	66.7	0.018	0.46
U500-0210	1/2	0.500	12.70	0.525	13.34	0.980	24.89	1	0.98	0.110	2.79	0.063	1.60	20.0	89.0	0.021	0.53
U500-0210-S	1/2	0.500	12.70	0.525	13.34	0.980	24.89	1	0.98	0.110	2.79	0.063	1.60	20.0	89.0	0.021	0.53
U500-0211	1/2	0.500	12.70	0.525	13.34	1.225	31.12	1 1/4	1.225	0.151	3.84	0.085	2.16	25.0	111.2	0.021	0.53
U562-0120-S	9/16	0.562	14.27	0.598	15.19	0.857	21.77	7/8	0.875	0.145	3.68	0.074	1.88	5.5	24.5	0.012	0.30
U562-0180	9/16	0.562	14.27	0.598	15.19	0.857	21.77	7/8	0.875	0.110	2.79	0.059	1.50	11.0	48.9	0.018	0.46
U562-0180-S	9/16	0.562	14.27	0.598	15.19	0.857	21.77	7/8	0.875	0.110	2.79	0.059	1.50	11.0	48.9	0.018	0.46
U625-0140	5/8	0.625	15.88	0.663	16.84	0.980	24.89	1	0.98	0.169	4.29	0.092	2.34	7.0	31.1	0.014	0.36
U625-0210	5/8	0.625	15.88	0.663	16.84	0.980	24.89	1	0.98	0.118	3.00	0.067	1.70	14.0	62.3	0.021	0.53
U750-0160	3/4	0.750	19.05	0.800	20.32	1.103	28.02	1 1/8	1.125	0.185	4.70	0.098	2.49	8.0	35.6	0.016	0.41
U750-0210	3/4	0.750	19.05	0.800	20.32	1.103	28.02	1 1/8	1.125	0.138	3.51	0.069	1.75	12.0	53.4	0.021	0.53
U750-0210-S	3/4	0.750	19.05	0.800	20.32	1.103	28.02	1 1/8	1.125	0.138	3.51	0.069	1.75	12.0	53.4	0.021	0.53

TO ORDER: WWW.ASRAYMOND.COM OR SEE PHONE & FAX NUMBERS ON BACK COVER



* Numbers with the suffix "S" are stainless steel.

