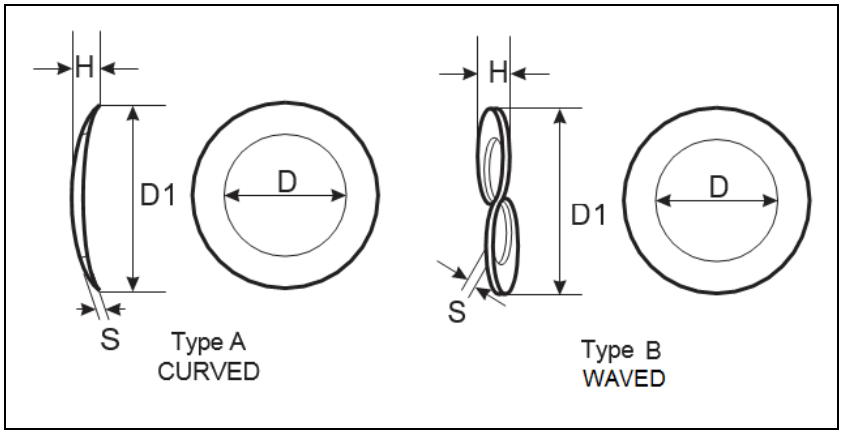
*a Division of Nissen Fasteners Florida LLC

Product Dimensions and Weights **DIN 137 Technical Specifications**

Metric DIN 137 Curved & Waved Spring Lock Washers



Dimensions of spring lock washers DIN 137, Curved Type A

Bolt size	D	D1	S		H		Weight kg/1000pcs
			Nominal size	tol.	min.	max.	
M3	3.2	8	0.5	±0.05	0.8	1.6	0.166
M3.5	3.7	8	0.5	±0.05	0.9	1.8	0.154
M4	4.3	9	0.5	±0.05	1	2	0.193
M5	5.3	11	0.5	±0.05	1.1	2.2	0.286
M6	6.4	12	0.5	±0.05	1.3	2.6	0.318
M7	7.4	14	0.8	±0.06	1.5	3	0.7
M8	8.4	15	0.8	±0.06	1.5	3	0.762
M10	10.5	21	1	±0.07	2.1	4.2	2.04
M12	13	24	1.2	±0.07	2.5	5	3.01
M14	15	28	1.6	±0.08	3	6	5.51
M16	17	30	1.6	±0.08	3.2	6.4	6.03
M18	19	34	1.6	±0.08	3.3	6.6	7.84
M20	21	36	1.6	±0.08	3.7	7.4	8.43
M22	23	40	1.8	±0.1	3.9	7.8	11.9
M24	25	44	1.8	±0.1	4.1	8.2	14.5
M27	28	50	2	±0.1	4.7	9.4	21.1
M30	31	56	2.2	±0.1	5	10	29.5
M33	34	60	2.2	±0.1	5.3	10.6	33.1
M36	37	68	2.5	±0.15	5.8	11.6	50.2

All measurements are in mm

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Dimensions of spring lock washers DIN 137, Waved Type B

Bolt Dia	D	D1	S	H min.	H max.	Weight kg/1000pcs
M3	3.2	8.0	0.5 ± 0.05	0.8	1.6	0.166
M3.5	3.7	8.0	0.5 ± 0.05	0.9	1.8	0.154
M4	4.3	9.0	0.5 ± 0.05	1.0	2.0	0.193
M5	5.3	11.0	0.5 ± 0.05	1.1	2.2	0.286
M6	6.4	12.0	0.5 ± 0.05	1.3	2.6	0.318
M7	7.4	14.0	0.8 ± 0.06	1.5	3.0	0.700
M8	8.4	15.0	0.8 ± 0.06	1.5	3.0	0.762
M10	10.5	21.0	1 ± 0.07	2.1	4.2	2.040
M12	13.0	24.0	1.2 ± 0.07	2.5	5.0	3.010
M14	15.0	28.0	1.6 ± 0.08	3.0	6.0	5.510
M16	17.0	30.0	1.6 ± 0.08	3.2	6.4	6.030
M18	19.0	34.0	1.6 ± 0.08	3.3	6.6	7.840
M20	21.0	36.0	1.6 ± 0.08	3.7	7.4	8.430
M22	23.0	40.0	1.8 ± 0.1	3.9	7.8	11.900
M24	25.0	44.0	1.8 ± 0.1	4.1	8.2	14.500
M27	28.0	50.0	2 ± 0.1	4.7	9.4	21.100
M30	31.0	56.0	2.2 ± 0.1	5.0	10.0	29.500
M33	34.0	60.0	2.2 ± 0.1	5.3	10.6	33.100
M36	37.0	68.0	2.5 ± 0.15	5.8	11.6	50.200

All measurements are in mm

Metric DIN 137 Type A and B Spring Lock Washers are specialty spring lock washers – Unlike standard split helical spring lock washers, the DIN 137 lock washers are uninterrupted formed disks in either a curved or waved configuration that are non-directional allowing the screw and or nut to be tightened in a clockwise or counter-clockwise manner. When compressed by tightening the nut, the DIN 137 lock washers exert a spring force between the tightened bolt and the substrate creating frictional resistance to rotation. Aspen Fasteners offers over 500,000 unique fastener products from stock in inch and metric standard in a variety of materials and finishes. The following sizes of DIN 137 Type A and B Spring Lock Washers are available for immediate shipping from stock: Diameters ranging from M2 to M36 in steel and stainless steel A2 and A4. View parts by clicking on the following link: DIN 137 Type A and B Spring Lock Washers

DIN (**D**eutsches **I**nstitut für **N**ormung - German Institute for Standardization) standards are issued for a variety of components including industrial fasteners as Metric DIN 137 Type A and B Spring Lock Washers. The DIN standards remain common in Germany, Europe and globally even though the transition to ISO standards is taking place. DIN standards continue to be used for parts which do not have ISO equivalents or for which there is no need for standardization as in the case for DIN 137 Type A and B Spring Lock Washers.

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1) Mechanical properties of stainless steel for metric DIN 137 Type A and B Spring Lock Washers

Stainless steels can be divided into three groups of steel - austenitic, ferritic and martensitic. Austenitic steel is by far the most common type (>90% of commercial fasteners). The steel groups and strength classes are designated by a four-digit sequence of letters and numbers (eg A2-70) as shown in the following table. DIN EN ISO 3506 governs screws and nuts made from stainless steel.

Steel group	Steel grade	Strength class	Screws, Nuts and Bolts			
			Tensile strength N/mm^2	Tensile strength PSI	Dia range	Nut Load N/mm^2
Austenitic	A2 and A4	50	500	70,000	<=M39	500
		70	700	100,000	<=M20	700
		80	800	118,000	<=M20	800

The tensile stress is calculated with reference to the tensile stress area (see DIN EN ISO 3506-1979). Nuts to be paired with same grade of stainless steel screws

Steel group	Property Strength class	Made From	Characteristics
Austenitic	50	A1, A2	Soft; cold worked, turned and soft pressed fasteners
	70	A2, A4	Cold worked, normal strength formed fasteners
	80	A2, A4	Extreme cold worked, high strength, special

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2) Chemical composition of stainless steel metric DIN 137 Type A and B Spring Lock Washers

Grade	USA Grade	**Material designation**	**Material no.**	**C %**	**Si ≤ %**	**Mn ≤ %**	**Cr %**	**Mo %**	**Ni %**
A 2	**304**	X 5Cr Ni 1810	1.4301	≤ 0.07	1.0	2.0	17.5 to 19.5	-	8.0 to 10.5
		X 2 Cr Ni 1811	1.4306	≤ 0.03	1.0	2.0	18.0 to 20.0	-	10 to 12.0
		X 8 Cr Ni 19/10	1.4303	≤ 0.07	1.0	2.0	17.0 to 19.0	-	11.0 to 13.0
A 4	**316**	X 5 Cr Ni Mo 1712	1.4401	≤ 0.07	1.0	2.0	16.5 to 18.5	2.0 to 2.5	10.0 to 13.0
		X 2 Cr Ni Mo 1712	1.4404	≤ 0.03	1.0	2.0	16.5 to 18.5	2.0 to 2.5	10 to 13

3) Chemical composition of steel metric DIN 137 Type A and B Spring Lock Washers

PROPERTY CLASS	MATERIAL AND TREATMENT	CHEMICAL COMPOSITION LIMITS %				TEMPERING TEMP ºC MIN.
		C		P	S	
		min.	max.	max.	max.	
4.6, 4.8, 5.8, 6.8	Low or medium carbon steel	-	0.55	0.05	0.06	-
8.8	Medium carbon steel quenched, tempered	0.25	0.55	0.04	0.05	425
9.8	Medium carbon steel quenched, tempered	0.25	0.55	0.04	0.05	425
10.9	Medium carbon steel additives e.g. boron, Mn, Cr or Alloy steel - quenched, tempered	0.20	0.55	0.04	0.05	425
12.9	Alloy steel - quenched, tempered	0.20	0.50	0.035	0.035	380

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4) Mechanical properties of steel for metric DIN 137 Type A and B Spring Lock Washers

MECHANICAL PROPERTY			PROPERTY CLASS								
							8.8				
			4.8	5.6	5.8	6.8	Up to M 16	Over M 16	9.8	10.9	12.9
Tensile Strength (Rm, N/mm²)	nom.		400	500		600	800		900	1000	1200
	min.		420	500	520	600	800	830	900	1040	1220
Vickers Hardness	min.		130	155	160	190	250	255	290	320	385
	max		250				320	336	360	380	435
Brinell Hardness	min.		124	147	152	181	319	242	266	295	353
	max.		238				385	319	342	363	412
Rockwell Hardness	min.	HR	71	79	82	89	-				
		HRC	-	-	-	-	20	23	28	32	39
		HR	95			99	-				
	max.	HRC	-	-	-	-	32	34	37	39	44
Yield Stress ReL. N/mm²	nom.		320	300	400	480	-				
	min.		340	300	420	480	-				
Stress at permanent set limit N/mm²	nom.		-				640		720	900	1080
	min.		-				640	660	720	940	1100

Disclaimer

Dimensional data and technical information for Metric DIN 137 Type A and B Spring Lock Washers was obtained from publicly available sources and not acquired through standards agencies. It has been completed and compiled for reference purposes only; where discrepancies are found they are subject to change without notice. Aspen Fasteners makes no warranties or representations regarding the accuracy and validity of the compiled information and data. Contact the relevant standards authorities for accurate and detailed information.