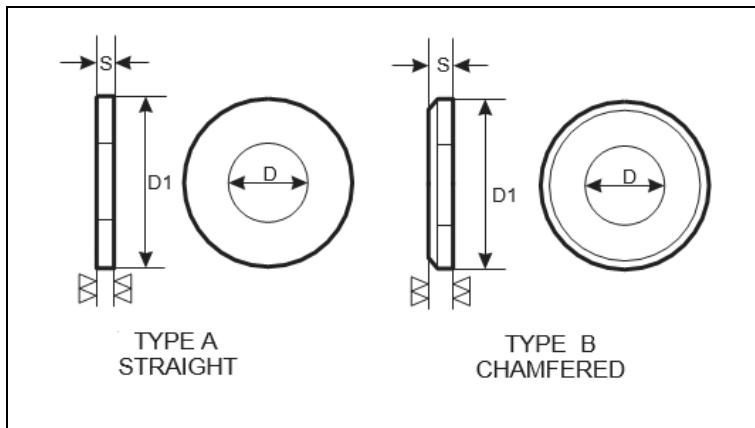


## Metric DIN 125 Flat Washers

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Nominal Diameter	D	D1	S	WEIGHT kg / 1000 pcs
M3	3.2	7	0.5	0.12
M4	4.3	9	0.8	0.3
M5	5.3	10	1	0.44
M6	6.4	12.5	1.6	1.14
M7	7.4	14	1.6	1.39
M8	8.4	17	1.6	2.14
M10	10.5	21	2	4.08
M12	13	24	2.5	6.27
M14	15	28	2.5	8.6
M16	17	30	3	11.3
M18	19	34	3	14.7
M20	21	37	3	17.2
M22	23	39	3	18.4
M24	25	44	4	32.3
M27	28	50	4	42.8
M30	31	56	4	53.6
M33	34	60	5	75.4
M36	37	66	5	92

...cont

Nominal Diameter	D	D1	S	WEIGHT kg / 1000 pcs
M39	40	72	6	133
M42	43	78	7	183
M45	46	85	7	220
M45	50	92	8	294
M52	54	98	8	330
M56	58	105	9	425
M58	60	110	9	471
M64	65	115	9	492
M72	74	125	10	625

All measurements are in mm

Metric DIN 125 Flat Washers are standard metric flat washers – a circular metal disc with a central hole. Typically used to distribute the load over a larger bearing surface either positioned below the head of a bolt or below the nut. This even distribution over a larger area reduces the chance of damaging the bearing surface. A washer could also be used if the outer diameter of a mating nut is smaller than the hole through which the screw is placed. 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 125 Flat Washers are available for immediate shipping from stock: Diameters ran in from M3 to M72 in aluminum, brass, nylon, steel as well as stainless steel A2 and A4.

DIN (Deutsches Institut für Normung - German Institute for Standardization) standards are issued for a variety of components including industrial fasteners as Metric DIN 125 Flat 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. The ISO equivalent for DIN 125 Flat Washers is ISO 7089.

## 1) Mechanical properties of stainless steel for metric DIN 125 Flat 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.

<b>Steel group</b>	<b>Steel grade</b>	<b>Strength class</b>	<b>Screws, Nuts and Bolts</b>			
			<b>Tensile strength N/mm<sup>2</sup></b>	<b>Tensile strength PSI</b>	<b>Dia range</b>	<b>Nut Load N/mm<sup>2</sup></b>
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

<b>Steel group</b>	<b>Property Strength class</b>	<b>Made From</b>	<b>Characteristics</b>
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 applications

## 2) Chemical composition of stainless steel metric DIN 125 Flat 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 125 Flat Washers

PROPERTY CLASS	MATERIAL AND TREATMENT	CHEMICAL COMPOSITION LIMITS %				TEMPERING TEMP °C 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

### 4) Mechanical properties of steel for metric DIN 125 Flat Washers

MECHANICAL PROPERTY		PROPERTY CLASS								
		4.8	5.6	5.8	6.8	8.8		9.8	10.9	12.9
						Up to M 16	Over M 16			
Tensile Strength (Rm, N/mm <sup>2</sup> )	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/mm <sup>2</sup>	nom.	320	300	400	480	-				
	min.	340	300	420	480	-				
Stress at permanent set limit N/mm <sup>2</sup>	nom.	-				640		720	900	1080
	min.	-				640	660	720	940	1100