

Original SCHNORR® load washers acc. to DIN 6796

These SCHNORR® load washers have been specially developed for high-strength bolts of grades 8.8 - 10.9. This represents the most powerful form of safety washer in the form of a disc spring. The load of the washers have been matched to these bolts and are 70 to 90% of the bolt load in the flat state.

These load washers conform to DIN 6796, edition Oct. 1987, and are designed for high demands on the protection of bolt joints. As a highly progressive load increase occurs at the end of the spring deflection when the load washer is flattened the load has been indicated as double the calculated value. Tests have shown that these values are comparable with the measured values.

For the protection of bolted joints only that load is available which remains after the load washer has initially set.

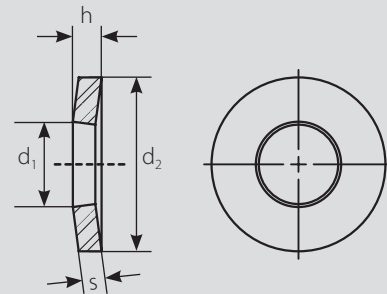
The table indicates the respective minimum height after the initial loading of the washer. Thus the maximum loss of height due to setting is limited.

Particular advantages of the SCHNORR® load washer:

- ① High axial load
- ② Optimum compensation for setting in the joint
- ③ Reduction of the dynamic loading of the screw.
- ④ Uniform concentric loading and high safety through a high degree of spring action
- ⑤ Suitable for captive fitting on a wide range of bolts (combi bolts)

Explanations on the table:

Technical requirements:	according to DIN 267, Part 26
Available material grad.:	spring steel acc. to DIN EN 10132-4, other materials on request
Available surfaces:	hardened, blank and oiled; mechanically plated; other materials on request
Article-no.:	applies to the normal version made of spring steel
h max.:	maximum dimension in delivery condition
h min.:	minimum dimension after setting test according to DIN 267, Part 26
Contact force:	contact forces for the setting test according to DIN 267, Part 26
Min. residual spring load:	spring load, which rests after load with the contact pressure acc. to DIN 267, Part 26 and subsequent relieving of 20 µm



Designation of an original SCHNORR® load washer DIN 6796:

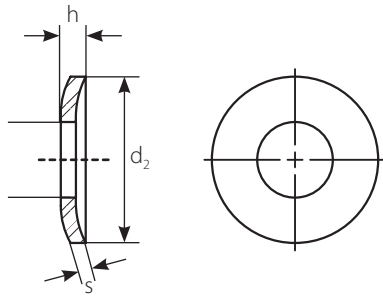
Size 8 made of spring steel
= load washer DIN 6796-8 FSt.

Original SCHNORR® load washers acc. to DIN 6796, material 1.1211 (C60S)

Article-number/ Order reference	Finish	Size	Ordering dimensions					Contact Force		Minimum residual spring load		Packaging		
			NM [mm]	d ₁ [mm]	d ₂ [mm]	s [mm]	d ₁ [inch]	d ₂ [inch]	s [inch]	h _{min.} [mm]	h _{max.} [mm]	F [lbf.]	F [lbf.]	Unit [pcs.]
700000 702110	blank, oiled Zn12M + passivation	2	2.2	5	0.4	0.087	0.197	0.016	0.020	0.024	*	*	10000	0.110
700100 702120	blank, oiled Zn12M + passivation	2.5	2.7	6	0.5	0.106	0.236	0.020	0.024	0.028	*	*	10000	0.196
700200 702130	blank, oiled Zn12M + passivation	3	3.2	7	0.6	0.126	0.276	0.024	0.028	0.033	*	*	10000	0.315
700300 702140	blank, oiled Zn12M + passivation	3.5	3.7	8	0.8	0.146	0.315	0.031	0.036	0.042	*	*	10000	0.547
700400 702150	blank, oiled Zn12M + passivation	4	4.3	9	1	0.169	0.354	0.039	0.044	0.051	848	910	5000	0.849
700500 702160	blank, oiled Zn12M + passivation	5	5.3	11	1.2	0.209	0.433	0.047	0.053	0.061	1.232	1.506	2500	1.515
700600 702170	blank, oiled Zn12M + passivation	6	6.4	14	1.5	0.252	0.551	0.059	0.067	0.079	1.931	2.113	2500	3.161
700700 702180	blank, oiled Zn12M + passivation	7	7.4	17	1.75	0.291	0.669	0.069	0.079	0.091	2.540	3.080	1000	5.571
700800 702190	blank, oiled Zn12M + passivation	8	8.4	18	2	0.331	0.709	0.079	0.088	0.102	3.350	3.867	1000	6.598
700900 702200	blank, oiled Zn12M + passivation	10	10.5	23	2.5	0.413	0.906	0.098	0.110	0.126	4.968	6.182	250	13.671
701000 702210	blank, oiled Zn12M + passivation	12	13	29	3	0.512	1.142	0.118	0.135	0.156	7.666	8.992	250	26.566
701100 702220	blank, oiled Zn12M + passivation	14	15	35	3.5	0.591	1.378	0.138	0.159	0.183	10.341	12.364	100	47.576
701200 702230	blank, oiled Zn12M + passivation	16	17	39	4	0.669	1.535	0.157	0.180	0.207	13.421	16.861	100	65.279
701300 702240	blank, oiled Zn12M + passivation	18	19	42	4.5	0.748	1.654	0.177	0.200	0.228	16.726	21.357	100	83.621
701400 702250	blank, oiled Zn12M + passivation	20	21	45	5	0.827	1.772	0.197	0.220	0.252	20.952	27.427	50	105.006
701500 702260	blank, oiled Zn12M + passivation	22	23	49	5.5	0.906	1.929	0.217	0.242	0.278	25.561	34.171	25	136.775
701600 702270	blank, oiled Zn12M + passivation	24	25	56	6	0.984	2.205	0.236	0.267	0.305	29.450	39.342	20	200.356
701700 702280	blank, oiled Zn12M + passivation	27	28	60	6.5	1.102	2.362	0.256	0.287	0.329	34.621	51.706	20	243.611
701800 702290	blank, oiled Zn12M + passivation	30	31	70	7	1.220	2.756	0.276	0.315	0.362	38.667	62.947	-	367.951

We would be glad to offer you safety washers type „VS“ with different finish on request.

Our surfaces are Cr 6-free and comply with the EU „Old Car“ (2000/53/EG) RoHS-(2002/95/CE) Directive as well as the WEEE Directive (2002/96/EC)



Description of an original SCHNORR® HS-Washer:

Size 12 made of spring steel:
= Safety Washer HS 12 FSt.
phosphated and oiled

The original SCHNORR® HS-Washer

This bolt locking device is, in principle, a load washer with a smaller outer diameter than those acc. to DIN 6796. A notable feature of these washers is the slightly curved form which provides a progressively increasing characteristic curve. Despite the smaller outside diameter dimensions this makes it possible to achieve the same load as the load washers acc. to DIN 6796. These washers are primarily used when the space available is insufficient for standardised load washers.

Explanations on the table:

Technical requirements:	according to DIN 267, Part 26
Available material grades:	spring steel acc. to DIN EN 10132-4, other materials on request
Available surfaces:	phosphated and oiled; mechanically plated, other materials on request
Article no.:	applies to the normal version made of spring steel
h max.:	maximum dimension in delivery condition
h min.:	minimum dimension after setting test according to DIN 267, Part 26
Contact force:	contact forces for the setting test according to DIN 267, Part 26
Minimum residual spring load :	spring load, which rests after load with the contact pressure acc. to DIN 267, Part 26 and subsequent relieving of 20 µm.

Original SCHNORR® HS-Washers, material 1.1211 (C60S)

Article-number/ Order reference	Finish	Size	Ordering dimensions								Contact Force	Minimum residual spring load	Packaging	
			d ₁ [mm]	d ₂ [mm]	s [mm]	d ₁ [inch]	d ₂ [inch]	s [inch]	h _{min.} [mm]	h _{max.} [mm]			Unit [pcs.]	Weight per 1000 pieces [lbs.]
416320 431510	Phosphated and oiled Zn20M + passivation	6	6.4	12	1.5	0.252	0.472	0.059	0.065	0.075	2.005	2.113	1000	2.079
416520 431520	Phosphated and oiled Zn20M + passivation	8	8.4	17	2	0.331	0.669	0.079	0.087	0.100	3.395	3.867	500	5.375
423220 431530	Phosphated and oiled Zn20M + passivation	10	10.5	21	2.5	0.413	0.827	0.098	0.108	0.124	5.216	6.182	250	10.836
426400 431540	Phosphated and oiled Zn20M + passivation	12	13	24	3	0.512	0.945	0.118	0.129	0.148	7.823	8.992	250	15.860
429320 431550	Phosphated and oiled Zn20M + passivation	14	15	28	3.5	0.591	1.102	0.138	0.150	0.171	10.071	12.364	100	25.596
430900 431560	Phosphated and oiled Zn20M + passivation	16	17	30	4	0.669	1.181	0.157	0.170	0.195	14.118	16.861	100	31.967
433750 431570	Phosphated and oiled Zn20M + passivation	18	19	33	4.5	0.748	1.299	0.177	0.189	0.217	16.321	21.357	100	42.681
435320 431580	Phosphated and oiled Zn20M + passivation	20	21	36	5	0.827	1.417	0.197	0.209	0.234	20.727	27.427	50	55.843
436620 431590	Phosphated and oiled Zn20M + passivation	22	23	40	5.5	0.906	1.575	0.217	0.232	0.264	26.977	34.171	50	77.316
439150 431600	Phosphated and oiled Zn20M + passivation	24	25	45	6	0.984	1.772	0.236	0.254	0.287	30.349	39.342	25	110.848
440100 431610	Phosphated and oiled Zn20M + passivation	27	28	50	6.5	1.102	1.969	0.256	0.276	0.315	34.845	51.706	20	147.577
442650 431620	Phosphated and oiled Zn20M + passivation	30	31	58	7	1.220	2.283	0.276	0.301	0.350	40.466	62.947	-	222.667

We would be glad to offer you HS-Washers with different finish on request.