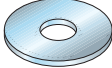
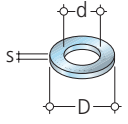
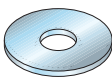


Washers¹⁾


Washer	Dimensions	d [mm]	D [mm]	s [mm]	Design
 EN ISO 7093-1 (DIN 9021)	M 6	6.4	18.0	1.6	gv; A4
	M 8	8.4	24.0	2.0	gv; A4
	M 10	10.5	30.0	2.5	gv; A4
	M 12	13.0	37.0	3.0	gv; A4
	M 16	17.0	50.0	3.0	gv; A4
	M 20	22.0	60.0	4.0	gv; A4
 EN ISO 7089 (DIN 125)	M 6	6.4	12.0	1.6	gv; A4
	M 8	8.4	16.0	1.6	gv; A4
	M 10	10.5	20.0	2.0	gv; A4
	M 12	13.0	24.0	2.5	gv; A4
	M 16	17.0	30.0	3.0	gv; A4
	M 20	21.0	37.0	3.0	gv; A4
 EN ISO 7094 (DIN 440)	M 6	6.6	22.0	2.0	gv; A4
	M 10	11.0	34.0	3.0	gv; A4
	M 12	13.5	44.0	4.0	gv; A4
	M 20	22.0	72.0	6.0	gv; A4

Order example

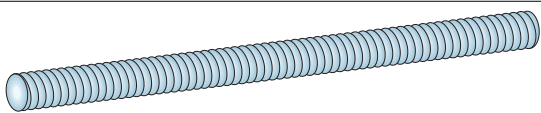
Washer 13 EN ISO 7089

¹⁾ Washers for stand-off installation → p. 41.

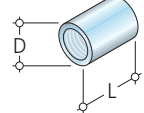
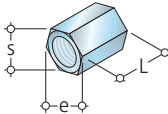
Spring washers

Spring washer DIN 127	Dimensions	h _{min} [mm]	D _{max} [mm]	s [mm]	Design
	A 6	3.6	11.8	1.6	gv; A4
	A 8	4.6	14.8	2.0	gv; A4
	A 10	5.0	18.1	2.2	gv; A4
	A 12	5.8	21.1	2.5	gv; A4
	A 16	7.8	27.4	3.5	gv; A4
	A 20	8.8	33.6	4.0	gv; A4
	A 24	11.0	40.0	5.0	gv; A4
	A 30	13.6	48.2	6.0	gv; A4

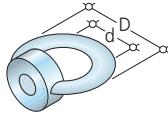
Threaded rods DIN 976-1 (length L = 1000 mm)

						
Threaded rod	M 6	M 8	M 10	M 12	M 16	M 20
Loadbearing capacity perm. F [kN] F _{Rd} [kN]	2.2 3.1	4.0 5.6	6.4 9.0	9.3 13.0	17.3 24.0	27.0 37.8
Finish	gv; A4					

Coupling sleeves

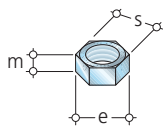
Round	Thread	D [mm]	L [mm]	perm. F _{Rd} [kN]	F _{Rd} [kN]	Design	
	M 6	10.0	20.0	2.2	3.1	gv; A4 on request	
	M 8	11.0	20.0	4.0	5.6		
	M 10	13.0	25.0	6.4	9.0		
	M 12	15.0	30.0	9.3	13.0		
	M 16	22.0	40.0	17.3	24.0		
	M 20	28.0	50.0	27.0	37.8		
	M 20	28.0	50.0	27.0	37.8		
Hexagon		e [mm]	s [mm]	L [mm]	perm. F _{Rd} [kN]	F _{Rd} [kN]	Design
	M 6	11.05	10.0	15.0	2.2	3.1	gv; A4 on request
	M 8	14.38	13.0	20.0	4.0	5.6	
	M 10	18.90	17.0	25.0	6.4	9.0	
	M 12	21.10	19.0	30.0	9.3	13.0	
	M 16	26.75	24.0	40.0	17.3	24.0	
	M 20	32.95	30.0	50.0	27.0	37.8	
	M 20	32.95	30.0	50.0	27.0	37.8	

Ring nuts to DIN 582

Thread	d [mm]	D [mm]	perm. F ²⁾ F _{Rd} [kN]	F _{Rd} [kN]	Design
	M 8	20.0	1.40	2.0	plain. gv
	M 10	25.0	2.30	3.2	
	M 12	30.0	3.40	4.8	
	M 16	35.0	7.00	9.8	
	M 20	40.0	12.00	16.8	
	M 24	50.0	18.00	25.2	

²⁾ Loading in central tension

Hexagon nuts to DIN 934 or EN 24032⁴⁾

Thread	e [mm] DIN 934	s [mm] DIN 934	m [mm] DIN 934	DIN EN 24032	Design	
	M 6	11.05	10.0	5.0	5.2	gv; A4
	M 8	14.38	13.0	6.5	6.8	gv; A4
	M 10	18.90	17.0	8.0	8.4	gv; A4
	M 12	21.10	19.0	10.0	10.8	gv; A4
	M 16	26.75	24.0	13.0	14.8	gv; A4
	M 20	32.95	30.0	16.0	18.0	gv; A4
	M 24	39.55	36.0	19.0	21.5	gv; A4
	M 27	45.20	41.0	22.0	23.8	gv
	M 30	50.85	46.0	24.0	25.6	gv
			(16.0) ³⁾			
			(18.0) ³⁾			

³⁾ Bracketed values EN 24032.

⁴⁾ For alternating loading we recommend self-locking nuts.