

MET

THREADED RODS, NUTS AND WASHERS

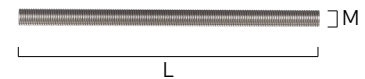
- Metric threaded products for connections and joints
- Available in carbon steel and A2 austenitic stainless steel for outdoor applications (SC3) up to 1 km from the sea and on T4 class timber

MGS 1000 - 4.8

THREADED ROD

CODE	rod	L [mm]	rod [in]	L [in]	pcs
MGS10008	M8	1000	0.32	39 3/8	10
MGS100010	M10	1000	0.40	39 3/8	10
MGS100012	M12	1000	0.48	39 3/8	10
MGS100014	M14	1000	0.56	39 3/8	10
MGS100016	M16	1000	0.63	39 3/8	10
MGS100018	M18	1000	0.71	39 3/8	10
MGS100020	M20	1000	0.79	39 3/8	10
MGS100022	M22	1000	0.87	39 3/8	10
MGS100024	M24	1000	0.95	39 3/8	10
MGS100027	M27	1000	1.07	39 3/8	10
MGS100030	M30	1000	1.19	39 3/8	10

4.8 steel class - electrogalvanized
DIN 975

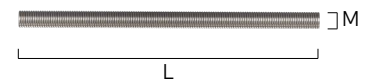


MGS 1000 - 8.8

THREADED ROD

CODE	rod	L [mm]	rod [in]	L [in]	pcs
MGS10888	M8	1000	0.32	39 3/8	1
MGS11088	M10	1000	0.40	39 3/8	1
MGS11288	M12	1000	0.48	39 3/8	1
MGS11488	M14	1000	0.56	39 3/8	1
MGS11688	M16	1000	0.63	39 3/8	1
MGS11888	M18	1000	0.71	39 3/8	1
MGS12088	M20	1000	0.79	39 3/8	1
MGS12488	M24	1000	0.95	39 3/8	1
MGS12788	M27	1000	1.07	39 3/8	1

8.8 steel class - electrogalvanized
DIN 975

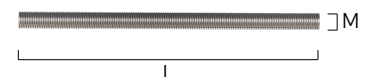


MGS 2200 - 4.8

THREADED ROD

CODE	rod	L [mm]	rod [in]	L [in]	pcs
MGS220012	M12	2200	0.48	86 5/8	1
MGS220016	M16	2200	0.63	86 5/8	1
MGS220020	M20	2200	0.79	86 5/8	1

4.8 steel class - electrogalvanized
DIN 975



MGS AI 975

THREADED ROD

A2
AISI 304

CODE	rod	L [mm]	rod [in]	L [in]	pcs
AI9758	M8	1000	0.32	39 3/8	1
AI97510	M10	1000	0.40	39 3/8	1
AI97512	M12	1000	0.48	39 3/8	1
AI97516	M16	1000	0.63	39 3/8	1
AI97520	M20	1000	0.79	39 3/8	1

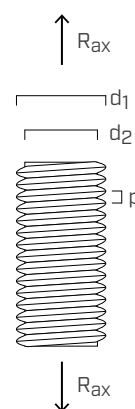
A2-70 (A2 | AISI304) stainless steel
DIN 975



MGS RODS STRUCTURAL VALUES

TENSILE STRENGTH

rod	d ₁ [mm]	d ₂ [mm]	p [mm]	A _{resist} [mm ²]	steel class		
					4.8 R _{ax,k} [kN]	8.8 R _{ax,k} [kN]	A2 R _{ax,k} [kN]
M8	8	6,47	1,25	36,6	13,2	26,4	23,1
M10	10	8,16	1,50	58,0	20,9	41,8	36,5
M12	12	9,85	1,75	84,3	30,3	60,7	53,1
M14	14	11,55	2,00	115,4	41,6	83,1	-
M16	16	13,55	2,00	156,7	56,4	112,8	98,7
M18	18	14,93	2,50	192,5	69,3	138,6	-
M20	20	16,93	2,50	244,8	88,1	176,3	154,2
M22	22	18,93	2,50	303,4	109,2	218,4	-
M24	24	20,32	3,00	352,5	126,9	253,8	-
M27	27	23,32	3,00	459,4	165,4	330,8	-
M30	30	25,71	3,50	560,6	201,8	403,6	-



Characteristic values according to EN 1993.

The design values are obtained from the characteristic values as follows: $R_{ax,d} = R_{ax,k} / \gamma_{M2}$.

The coefficient γ_{M2} should be taken according to the current regulations used for the calculation.

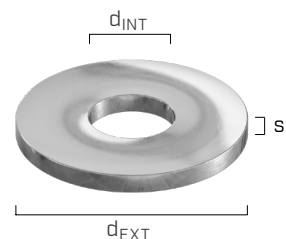
ULS 9021

WASHER

CODE	rod	d _{INT} [mm]	d _{EXT} [mm]	s [mm]	d _{INT} [in]	d _{EXT} [in]	s [in]	pcs
ULS8242	M8	8,4	24,0	2,0	0.34	0.95	0.08	200
ULS10302	M10	10,5	30,0	2,5	0.4	1.19	0.10	200
ULS13373	M12	13,0	37,0	3,0	0.5	1.46	0.12	100
ULS15443	M14	15,0	44,0	3,0	0.6	1.74	0.12	100
ULS17503	M16	17,0	50,0	3,0	0.7	1.97	0.12	100
ULS20564	M18	20,0	56,0	4,0	0.8	2.21	0.16	50
ULS22604	M20	22,0	60,0	4,0	0.9	2.37	0.16	50

* ISO 7093 differs from DIN 9021 in the surface hardness.

HV 100 steel - electrogalvanized
DIN 9021 (ISO 7093*)

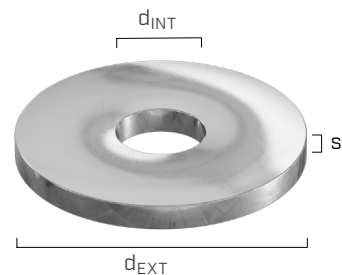


ULS 440

WASHER

CODE	rod	d _{INT} [mm]	d _{EXT} [mm]	s [mm]	d _{INT} [in]	d _{EXT} [in]	s [in]	pcs
ULS11343	M10	11,0	34,0	3,0	0.44	1.34	0.12	200
ULS13444	M12	14,0	44,0	4,0	0.56	1.74	0.16	200
ULS17565	M16	17,0	56,0	5,0	0.67	2.21	0.20	50
ULS22726	M20	22,0	72,0	6,0	0.87	2.84	0.24	50
ULS24806	M22	24,0	80,0	6,0	0.95	3.15	0.24	25

HV 100 steel - electrogalvanized
DIN 440 R

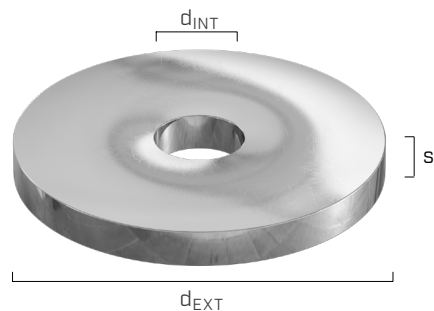


ULS 1052

WASHER

CODE	rod	d _{INT} [mm]	d _{EXT} [mm]	s [mm]	d _{INT} [in]	d _{EXT} [in]	s [in]	pcs
ULS14586	M12	14,0	58,0	6,0	0.56	2.29	0.24	50
ULS18686	M16	18,0	68,0	6,0	0.71	2.68	0.24	50
ULS22808	M20	22,0	80,0	8,0	0.87	3.15	0.32	25
ULS25928	M22	25,0	92,0	8,0	0.99	3.63	0.32	20
ULS271058	M24	27,0	105,0	8,0	1.07	4.14	0.32	20

HV 100-250 steel - electrogalvanized
DIN 1052

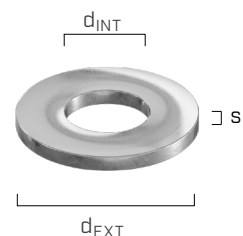


ULS 125

WASHER

CODE	rod	d _{INT} [mm]	d _{EXT} [mm]	s [mm]	d _{INT} [in]	d _{EXT} [in]	s [in]	pcs
ULS81616	M8	8,4	16,0	1,6	0.34	0.63	0.07	1000
ULS10202	M10	10,5	20,0	2,0	0.42	0.79	0.08	500
ULS13242	M12	13,0	24,0	2,5	0.52	0.95	0.10	500
ULS17303	M16	17,0	30,0	3,0	0.67	1.19	0.12	250
ULS21373	M20	21,0	37,0	3,0	0.83	1.46	0.12	250
ULS25444	M24	25,0	44,0	4,0	0.99	1.74	0.16	200
ULS28504	M27	28,0	50,0	4,0	1.11	1.97	0.16	100
ULS31564	M30	31,0	56,0	4,0	1.23	2.21	0.16	20

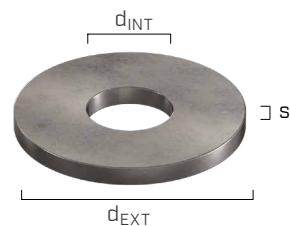
HV 100 steel - electrogalvanized
DIN 125 A (ISO 7089)



CODE	rod	d _{INT} [mm]	d _{EXT} [mm]	s [mm]	d _{INT} [in]	d _{EXT} [in]	s [in]	pcs
AI90218	M8	8,4	24,0	2,0	0.34	0.95	0.08	500
AI902110	M10	10,5	30,0	2,5	0.42	1.19	0.10	500
AI902112	M12	13,0	37,0	3,0	0.52	1.46	0.12	200
AI902116	M16	17,0	50,0	3,0	0.67	1.97	0.12	100
AI902120	M20	22,0	60,0	4,0	0.87	2.37	0.16	50

* ISO 7093 differs from DIN 9021 in the surface hardness.

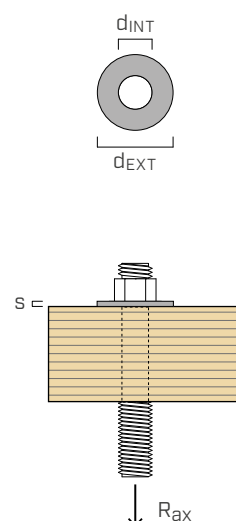
A2 | AISI304 stainless steel
DIN 9021 (ISO 7093-1*)



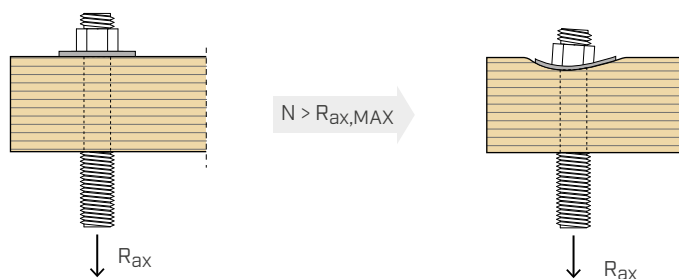
ULS WASHERS STRUCTURAL VALUES

PULL-THROUGH RESISTANCE IN THE TIMBER

rod	standard	d _{INT} [mm]	d _{EXT} [mm]	s [mm]	R _{ax,k} [kN]
M10	ULS 9021	10,5	30,0	2,5	4,65
	ULS 440	11,0	34,0	3,0	6,10
	ULS 1052	-	-	-	-
	ULS 125	10,5	20,0	2,0	1,71
M12	ULS 9021	13,0	37,0	3,0	7,07
	ULS 440	14,0	44,0	4,0	10,25
	ULS 1052	14,0	58,0	6,0	18,66
	ULS 125	13,0	24,0	2,5	2,40
M16	ULS 9021	17,0	50,0	3,0	13,02
	ULS 440	17,0	56,0	5,0	16,77
	ULS 1052	18,0	68,0	6,0	25,33
	ULS 125	17,0	30,0	3,0	3,60
M20	ULS 9021	22,0	60,0	4,0	18,35
	ULS 440	22,0	72,0	6,0	27,69
	ULS 1052	22,0	80,0	8,0	34,85
	ULS 125	21,0	37,0	3,0	5,47
M24	ULS 9021	-	-	-	-
	ULS 440	-	-	-	-
	ULS 1052	27,0	105,0	8,0	60,65
	ULS 125	25,0	44,0	4,0	7,72



CRITICAL ISSUE: WASHER HEAD PULL-THROUGH INTO TIMBER



GENERAL PRINCIPLES:

- Characteristic values according to EN 1995-1-1.
- Design values can be obtained from characteristic values as follows:

$$R_{ax,d} = \frac{R_{ax,k} \cdot k_{mod}}{\gamma_M}$$

The coefficients γ_M and k_{mod} should be taken according to the current regulations used for the calculation.

- For the calculation process a timber characteristic density $\rho_k = 385 \text{ kg/m}^3$ has been considered.
- The pull-through resistance of a washer is proportional to its contact surface with the timber element.

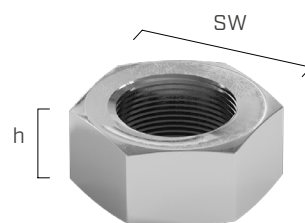
MUT 934

HEXAGONAL NUT

CODE	rod	SW [mm]	h [mm]	h [in]	pcs
MUT9348	M8	13	6,5	1/4	400
MUT93410	M10	17	8,0	5/16	500
MUT93412	M12	19	10,0	3/8	500
MUT93414	M14	22	11,0	7/16	200
MUT93416	M16	24	13,0	1/2	200
MUT93418	M18	27	15,0	9/16	100
MUT93420	M20	30	16,0	5/8	100
MUT93422	M22	32	18,0	11/16	50
MUT93424	M24	36	19,0	3/4	50
MUT93427	M27	41	22,0	7/8	25
MUT93430	M30	46	24,0	15/16	25

* ISO 4032 differs from DIN 934 for parameter h and, for diameters M10, M12, M14 and M22 also for the SW parameter.

8 steel class - electrogalvanized
DIN 934 (ISO 4032*)

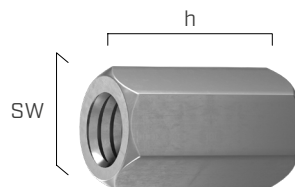


MUT 6334

CONNECTING NUT

CODE	rod	SW [mm]	h [mm]	h [in]	pcs
MUT633410	M10	17	30,0	1 3/16	10
MUT633412	M12	19	36,0	1 7/16	10
MUT633416	M16	24	48,0	1 7/8	25
MUT633420	M20	30	60,0	2 3/8	10

8 steel class - electrogalvanized
DIN 6334



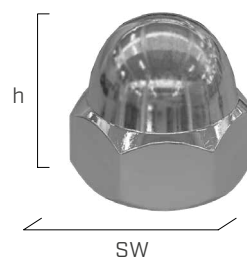
MUT 1587

BLIND NUT

CODE	rod	SW [mm]	h [mm]	h [in]	pcs
MUT15878S	M8	13	15,0	9/16	200
MUT158710S	M10	17	18,0	11/16	50
MUT158712S	M12	19	22,0	7/8	50
MUT158714S	M14	22	25,0	1	50
MUT158716S	M16	24	28,0	1 1/8	50
MUT158718S	M18	27	32,0	1 1/4	50
MUT158720S	M20	30	34,0	1 5/16	25
MUT158722S	M22	32	39,0	1 9/16	25
MUT158724S	M24	36	42,0	1 5/8	25

Single-piece turned nut.

6 steel class - electrogalvanized
DIN 1587



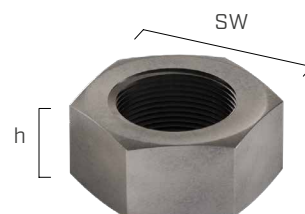
MUT AI 934

HEXAGONAL NUT

CODE	rod	SW [mm]	h [mm]	h [in]	pcs
AI9348	M8	13	6,5	1/4	500
AI93410	M10	17	8,0	5/16	200
AI93412	M12	19	10,0	3/8	200
AI93416	M16	24	13,0	1/2	100
AI93420	M20	30	16,0	5/8	50

* ISO 4032 differs from DIN 934 for parameter h and, for diameters M10 and M12 also for the SW parameter.

A2-70 (A2 | AISI304) stainless steel
DIN 934 (ISO 4032*)



A2
AISI 304

MUT AI 985

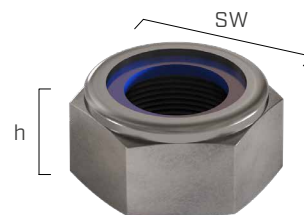
SELF-LOCKING NUT

A2
AISI 304

CODE	rod	SW [mm]	h [mm]	h [in]	pcs
AI9858	M8	13	8,0	5/16	500
AI98510	M10	17	10,0	3/8	200
AI98512	M12	19	12,0	1/2	200
AI98516	M16	24	16,0	5/8	100

* ISO 10511 differs from DIN 995 for parameter h and, for diameters M10 and M12 also for the SW parameter.

A2-70 (A2 | AISI304) stainless steel
DIN 985 (ISO 10511*)



MUT AI 1587

BLIND NUT

A2
AISI 304

CODE	rod	SW [mm]	h [mm]	h [in]	pcs
AI158710	M10	17	18,0	11/16	100
AI158712	M12	19	22,0	7/8	100
AI158716	M16	24	28,0	1 1/8	50
AI158720	M20	30	34,0	1 5/16	25

Single-piece turned nut.

A2 | AISI304 stainless steel
DIN 1587

