

Nord-Lock X-series steel washers

EN 1.7225 or equivalent, zinc flake coating (Delta Protekt®), through hardened

Dimension chart

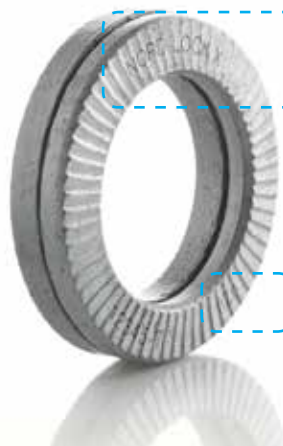
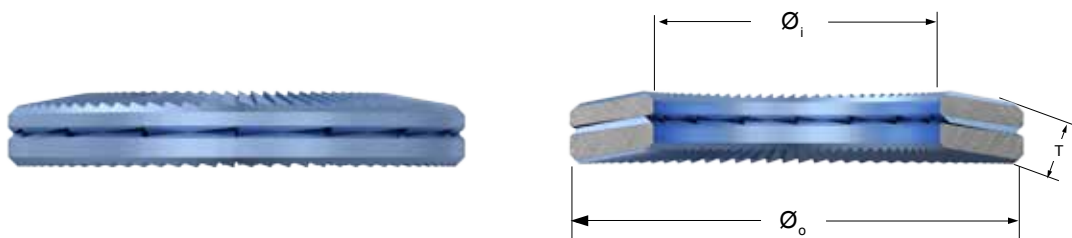
Washer size	Bolt size		Flat position		Thickness T [mm]	Min. package [pairs]	Approx. weight kg / 100 pairs
	Metric	UNC	Ø _i [mm]	Ø _o [mm]			
NLX6sp	M6		6,3	13,5	2,2	200	0,17
NLX8	M8	5/16"	8,4	13,5	2,3	200	0,14
NLX8sp	M8	5/16"	8,4	16,6	2,3	200	0,27
NLX10	M10		10,5	16,6	3,0	200	0,28
NLX10sp	M10		10,5	21,0	3,5	200	0,66
NLX12	M12		12,5	19,5	3,5	200	0,45
NLX12sp	M12		12,5	25,4	4,2	100	1,17
NLX16	M16	5/8"	16,6	25,4	4,8	100	1,01
NLX16sp	M16	5/8"	16,6	30,7	4,8	100	1,84
NLX20	M20		20,7	30,7	6,1	100	1,75

Ø_i (mm)
NLX6sp–NLX20 ±0,2

Ø_o (mm)
NLX6sp–NLX20 ±0,2

T (mm)
NLX6sp–NLX16sp +0,00/-0,4
NLX20 +0,00/-0,5

For other dimensions please contact your regional Nord-Lock office for more information.



X-series laser marking, type code table

Washer type	Code
Steel washers, Delta Protekt® coating	fiZn

X-series steel washers material / type guide

Steel type	Examples of application	Washer types	Treatment Surface coating	Washer hardness*	Corrosion resistance	Bolt grades	Temperature range**
EN 1.7225 or equivalent	General steel applications	Regular outer diameter Enlarged outer diameter (sp)	Through hardened Delta Protekt® base coat (KL100) and top coat (VH302GZ)	≥ 485HV1	Minimum 600 hours in salt spray test (according to ISO9227)	Up to 12.9	-40°C to 150°C

* In order to assure the unique mechanical locking function of the Nord-Lock X-series washers, the hardness of the mating surfaces must be lower than the hardness of the Nord-Lock X-series washers (see table above).

** Temperature recommendations based on information from the raw material supplier. Locking function not affected within the specification.

Torque guidelines

Nord-Lock X-series steel washers with zinc flake coating (Delta Protokt®)

Nord-Lock X-series steel washers with electro zinc plated **bolt grade 8.8**

Washer size	Bolt size	Pitch [mm]	Oil, $G_f=75\%$ $\mu_{th}=0,15, \mu_h=0,19$		Cu/C paste, $G_f=75\%$ $\mu_{th}=0,13, \mu_h=0,18$		Dry, $G_f=62\%$ $\mu_{th}=0,18, \mu_h=0,2$	
			Torque [Nm]	Clamp load [kN]	Torque [Nm]	Clamp load [kN]	Torque [Nm]	Clamp load [kN]
NLX6	M6	1,0	13	9,7	12	9,7	12	8,0
NLX8	M8	1,25	32	18	29	18	29	15
NLX10	M10	1,5	62	28	57	28	56	23
NLX12	M12	1,75	107	40	99	40	97	33
NLX16	M16	2,0	260	75	240	75	237	62
NLX20	M20	2,5	510	118	470	118	464	97

μ_{th} = thread friction coefficient

μ_h = under head friction coefficient

Cu/C paste = copper/graphite paste (Molykote® 1000)

Oil = WD40 has been used

G_f = Ratio of yield point. When tightening according to guidelines and with no deviation, this is the pre-stress achieved expressed as % of yield point.

Thread friction coefficients have theoretical values but are verified through testing. Under head friction coefficients have been established by tests.

Nord-Lock X-series steel washers with non-plated **bolt grade 10.9**

Washer size	Bolt size	Pitch [mm]	Oil, $G_f=71\%$ $\mu_{th}=0,15, \mu_h=0,15$		Cu/C paste, $G_f=75\%$ $\mu_{th}=0,13, \mu_h=0,15$	
			Torque [Nm]	Clamp load [kN]	Torque [Nm]	Clamp load [kN]
NLX6	M6	1,0	15,5	12,9	15,5	13,6
NLX8	M8	1,25	37	23	37	25
NLX10	M10	1,5	73	37	73	39
NLX12	M12	1,75	126	54	126	57
NLX16	M16	2,0	307	100	306	106
NLX20	M20	2,5	602	156	600	165

Nord-Lock X-series steel washers with non-plated **bolt grade 12.9**

Washer size	Bolt size	Pitch [mm]	Oil, $G_f=71\%$ $\mu_{th}=0,15, \mu_h=0,13$		Cu/C paste, $G_f=75\%$ $\mu_{th}=0,13, \mu_h=0,14$	
			Torque [Nm]	Clamp load [kN]	Torque [Nm]	Clamp load [kN]
NLX6	M6	1,0	17,4	15,4	18	16,3
NLX8	M8	1,25	42	28	43	30
NLX10	M10	1,5	82	44	85	47
NLX12	M12	1,75	142	65	146	68
NLX16	M16	2,0	345	120	355	127
NLX20	M20	2,5	676	188	696	198

Nord-Lock X-series washers with enlarged outer diameter

Nord-Lock X-series washers are available with an enlarged outer diameter, referred to as 'sp' washers. Please check the dimension chart for available sizes. 'Sp' washers are designed for use on large/slotted holes, painted/sensitive surfaces or soft materials. Use Nord-Lock sp washers with flanged bolts or nuts for optimum load distribution and maximum spring effect.

\varnothing inner regular = \varnothing inner sp

\varnothing outer regular < \varnothing outer sp

