

USER MANUAL

Nord-Lock steel construction washers

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THE SMART SYSTEM THAT PREVENTS YOUR BOLT FROM ROTATING LOOSE

Nord-Lock SC-washers secure bolted joints with tension instead of friction. The system is comprised of a pair of washers with cams on one side and radial teeth on the opposite side. Since the cam angle ' α ' is greater than the thread pitch ' β ' a wedge effect is created by the cams, preventing the bolt from rotating loose.

Pre-glued

Nord-Lock SC-washers are pre-glued in pairs upon delivery to facilitate first time mounting. The glue will no longer be effective after first use.

Reuse

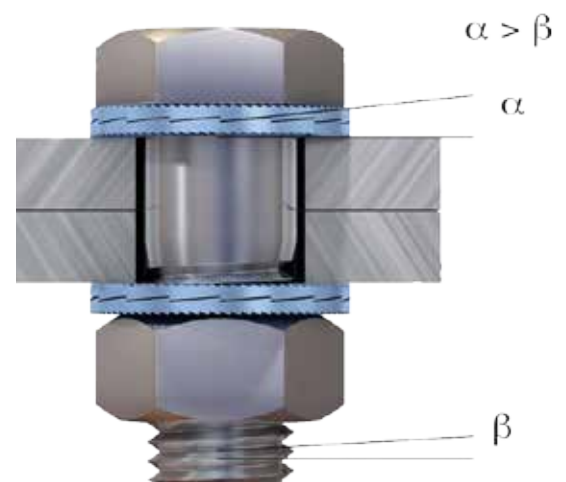
It is possible to reuse Nord-Lock SC-washers. Visually inspect the cams and serrations for obvious defects before re-installation. Make sure the washers are installed in pairs, cam face to cam face. Reusability depends on conditions of use. Please note that the Lifetime Warranty is not applicable during reuse.

CE

Nord-Lock SC-washers are designed for use in steel construction applications and to fit HV/HR sets (bolts and nuts in accordance to the European standard EN 14399-4 / EN14399-3). Nord-Lock SC-washers received CE conformity for use with HV-bolts, but its design is suitable also for use with HR-bolts.

Traceability

Every box of Nord-Lock SC-washers has a control number. Using the unique control number, every washer batch can be traced from the material certificate of the steel, through the entire production process to the finished washer. Nord-Lock SC-washers are also laser marked with the Nord-Lock brand, control number and a type code. The laser-marking is only for identification and will not last if being re-used.



We are convinced that you are going to be satisfied with your locking product.

Nord-Lock washers safely secure bolted joints that are subjected to extreme vibration and dynamic loads.

CORRECT USE OF NORD-LOCK SC-WASHERS

Through holes

Nord-lock SC-washers are very simple to use. They come pre-glued together, ready to be installed together with your HV- or HR bolt set. Through holes require two pairs of Nord-Lock SC-washers - one pair for securing the bolt and one pair for securing the nut.



Designs where Nord-Lock SC-washers are not recommended:

- ✘ With chamfered plain washers.
- ✘ When mating surfaces are not locked in place.
- ✘ When mating surfaces are harder than the washers.
- ✘ For applications with extremely large settlements.



ASSEMBLY INSTRUCTIONS

IT'S EASY TO ASSEMBLE NORD-LOCK WASHERS

1. Install the pre-assembled washers in pairs, cam face to cam face. For each connection two washer-pairs are needed, one to secure the bolt and one to secure the nut.
2. Turn both fasteners in order to close the cams on both washers before tightening to minimize settlements.
3. Tighten the bolt at a torque corresponding to the desired clamp load, using a calibrated torque wrench. Keep either the bolt or nut secured when tightening the other part (bolt/nut).

Remark: Torque values provided by the bolt manufacturer are only valid for use together with flat washers according to 14399-5 or 14399-6. When using Nord-Lock SC-washers the torque values needs to be adjusted, see page 4.



Correct assembly, with two washers pairs, one to secure the bolt and one to secure the nut.

TECHNICAL DATA

MATERIAL INFORMATION

Material	Steel 1.7182 or equivalent
Hardness	HV1 > 465 HV through hardened
Surface coating	Zinc flake coated free of cadmium + chrome VI

DIMENSION CHART

Washer size	Bolt size	ϕ_i [mm]	ϕ_o [mm]	Thickness T [mm]	Chamfer H [mm]
NL12SC	M12	13,1	23,7	4,6	1,2
NL16SC	M16	17,1	29,7	4,6	1,2
NL20SC	M20	21,4	36,7	4,6	1,6
NL22SC	M22	23,4	38,7	4,6	1,6
NL24SC	M24	25,3	43,7	4,6	1,6
NL 27SC	M27	28,4	49,5	5,8	1,8
NL 30SC	M30	31,4	55,4	5,8	1,8
NL 36SC	M36	37,4	65,4	6,0	1,6

TORQUE GUIDELINES

Washer size	Reduced preload force	Modified torque method	Modified combined method* [torque + angle]
	$F_{P,C,NL}$	torque moment $M_{A,NL}$	pre-torque moment $M_{A,MKV,NL}$
	[kN]	[Nm]	[Nm]
NL12SC	45	130	100
NL16SC	90	330	250
NL20SC	145	660	490
NL22SC	170	850	640
NL24SC	200	1100	825
NL27SC	260	1600	1220
NL30SC	315	2150	1650
NL36SC	460	3750	2800

Nord-Lock SC-washers are developed to be used within the steel construction industry together with HV- or HR bolt sets in accordance to the European standard EN 14399-4 / EN14399-3.

* Torque conditions are specified in ETA-13/0246 for HV bolts, grade 10.9

TIGHTENING ANGLES

	Degrees	Parts of revolution
$t < 2d$	45°	1/8
$2d \leq t < 6d$	60°	1/6
$6d \leq t \leq 10d$	90°	1/4
$10d < t$	No recommendations	

Tightening angles* when using the combined method. Varies depending on clamp length, t, in relation to bolt diameter, d.

* Tightening angles are specified in ETA-13/0246.