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	$ø_i$ [mm]	$ø_o$ [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

Please note that the below torque guidelines are valid for HV bolts only. If you want to use HR bolts in conjunction with SC washers, please contact your Nord-Lock office.

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

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

Tightening angles

t < 2d	45°	1/8
2d ≤ t < 6d	60°	1/6
6d ≤ t ≤ 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.*

Advantages

- Prevents loosening caused by vibration and dynamic loads
- Quick to install and removable with standard tools
- Easy and safe installation on HV bolts due to double sided chamfer
- Locking function not affected by lubrication
- Defined and uniform friction condition which result in less deviation of achieved preload
- Same temperature characteristics as standard bolt/nut
- Reusable
- High corrosion resistance
- Reliable locking, even for joints with short clamp length

Certificates & approvals

- CE conformity for HV bolts according to ETA-13/0246
- DIBt (Deutsches Institut für Bautechnik):
  - National Technical Approval No. Z-14.4-629
  - European Technical Approval ETA-13/0246
- TÜV (Technischer Überwachungsverein)

CE

More information: **www.nord-lock.com/certificates**

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NORD-LOCK SC-WASHERS

For steel construction applications



NORD-LOCK®

The original washers
Now available for HV/HR sets

Based on the leading Nord-Lock wedge-locking technology, we have now developed Nord-Lock steel construction washers (SC), especially 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).



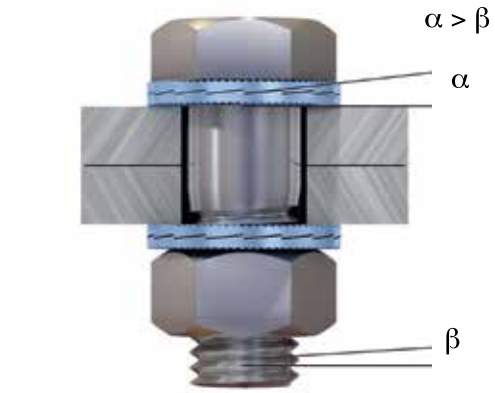
The Nord-Lock wedge-locking solution can now be effectively applied in structural steelwork. HV/HR sets are frequently used in steel construction applications.

The radius under the bolt head is a particular characteristic of these sets. The Nord-Lock SC-washers have therefore chamfers on the inner diameter. This makes it easy to replace the standard plain washer (EN 14399-6) by a Nord-Lock SC-washer pair and ensure an optimal contact surface between bolt and washer. Since the chamfer is present on both sides of each pair it eliminates the risk of incorrect installation of the washer.

The principle

Nord-Lock offers an effective bolt securing system to safely secure bolted joints exposed to severe vibration and dynamic loads.

The system, which utilizes tension instead of friction to secure bolted joints, is comprised of a pair of washers that has 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.



When the bolt and/or nut is tightened the radial teeth grip and lock the mating surfaces, allowing movement only across the cam faces. Any rotation of the bolt/nut is blocked by the wedge-effect of the cams. With Nord-Lock SC-washers, the proven wedge-locking principle can be implemented on bolted connections for steel construction, meaning HV sets, ensuring the safety of the application.

Nord-Lock SC-washers are CE-marked for use with HV sets. The safe usage with high-strength bolts has also been confirmed by the National Technical Approval No. Z-14.4-629 and by the European Technical Approval ETA-13/0246 issued by DIBT (available upon request).

Assembly examples

Nord-Lock SC-washers are intended to be used with HV and HR bolts and nuts:



Through holes
Through holes require the use of two pairs of Nord-Lock SC-washers. One pair for securing the bolt and a second pair for securing the nut. Turn both fasteners in order to close the cams on both washer pairs before tightening to minimize settlements. Keep the bolt secure whilst tightening the nut.



Designs where Nord-Lock SC-washers are not recommended

- With chamfered plain washers.
- Mating surfaces that are not locked in place.
- Mating surfaces harder than the washers
- Extremely soft mating surfaces (e.g. wood, plastic).
- Applications with extremely large settlements.

Applications

Nord-Lock SC-washers are used in a wide variety of applications across the Construction and Bridge Building industry. Applications include steel-framed building constructions, steel constructions / special steel constructions, bridge building, conveyor technology, power plant construction, airport construction, temporary structures, cranes and crane tracks.

