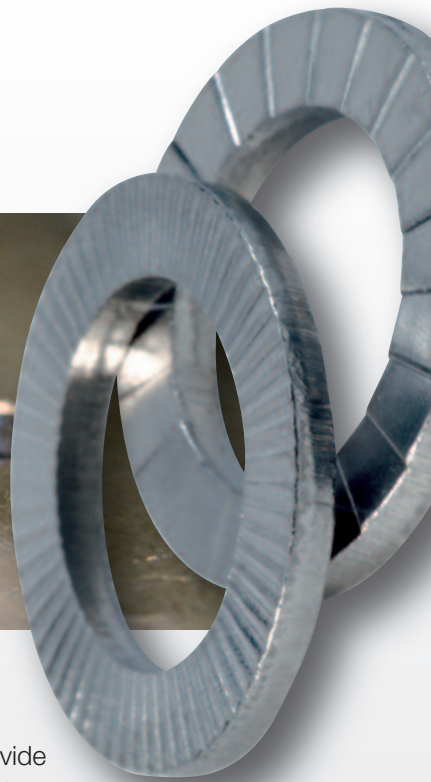
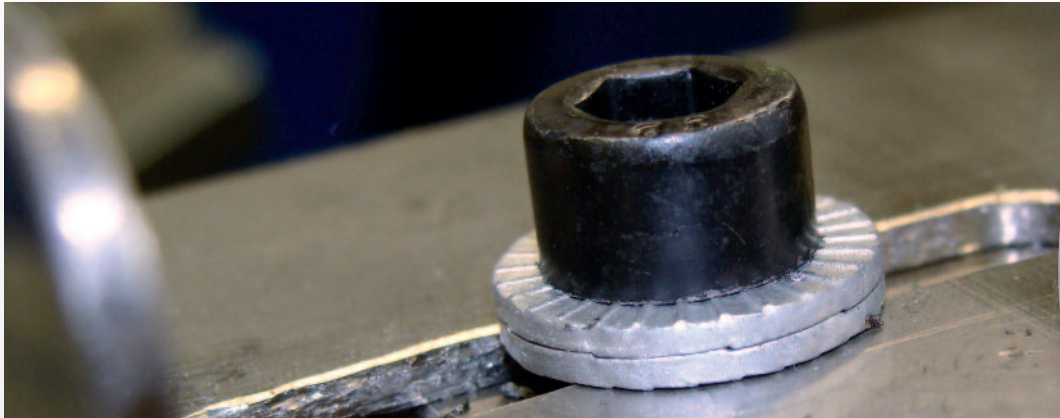


HEICO-LOCK

WEDGE LOCK WASHERS

WEDGE LOCK WASHERS

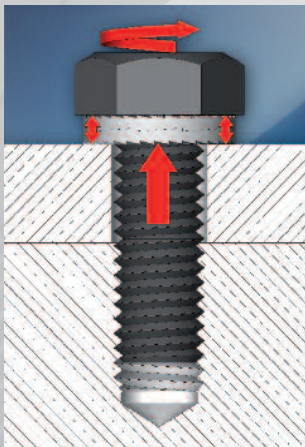


The Heico-Lock wedge locking system delivers high quality anti-vibration security for the most demanding of bolted joint applications.

Even under extremes of vibration or dynamic loads, HEICO-LOCK wedge lock washers provide maximum reliability. When the bolt is tightened, the external radial teeth of the HEICO-LOCK wedge lock washers embed themselves in an interlocking fashion with the respective mating surface. If the securing system is subject to dynamic stress, movement is only possible between the internal washer surfaces. This results in an increase in the preload force.

- Certified system for securing bolts, working at low and high preload levels
- Particularly suitable for dynamic loads – including when using lubricants
- Can be re-used without any reduction in function or quality
- Very easy to install and remove (wedge lock washers are supplied as a pre-assembled pair)
- Also suitable for high-tensile bolts of 8.8, 10.9 and 12.9 and their respective nuts
- Available in steel or stainless steel with narrow or wide bearing surfaces – other materials such as Inconel and SMO are available upon request
- Available from M3–M42 and ¼”–1” – custom sizes upon request

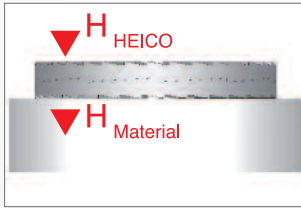
FUNCTIONAL PRINCIPLE



An important feature of HEICO-LOCK wedge lock washers, setting them apart from other systems that are available, is the securing of the bolt fastening using preload force rather than friction

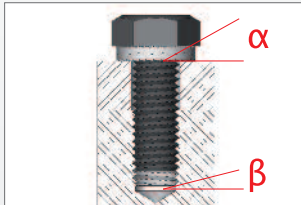
- Wedge-shaped surface on the inside of the lock washers, radial teeth on the outside
- Interlocking embedding of the radial teeth with the respective mating surface (when the bolt is tightened)
- System movement only possible between the inside washer surfaces, allowing the securing system to readjust itself automatically
- Increase in clamping force

TECHNICAL DATA



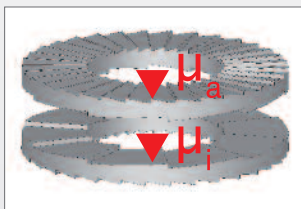
1. Difference in hardness: $H_{HEICO} > H_{Material}$

- The surface hardness of HEICO-LOCK wedge lock washers is greater than that of structural grade and high tensile bolts (8.8, 10.9, 12.9)
Steel (through-hardened) 485 \pm 25 HV0.3
Stainless steel (surface-hardened) > 520 HV0.05



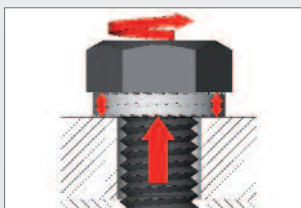
2. Difference in angles: $\alpha > \beta$

- The wedge angle (α) between the HEICO-LOCK wedge lock washers is greater than the pitch (β) of the bolt thread
- This angle means the expansion in thickness of the HEICO-LOCK wedge lock washers is greater than the possible longitudinal movement of the bolt along the thread



3. Difference in friction: $\mu_a > \mu_i$

- The wedge-shaped surfaces have a considerably lower friction coefficient μ_i than the toothed outside of the washers (friction coefficient μ_a)
- Loosening caused by dynamic stresses causes movement between the two washers in the region of the wedged surfaces



4. Difference in preload: $F_{dyn} > F_{stat}$

- An expansion in thickness of the HEICO-LOCK wedge lock washers as a result of loosening leads to an increase in the clamping force
- This causes an increase in the preload compared to when in a static state and thus causes the bolt to self-lock

FIELDS OF APPLICATION



Mechanical engineering



Wind energy technology



Automotive



Agriculture and forestry



Railway



and many more

INSTALLATION EXAMPLES



Hexagon bolt in a through-hole, secured on both sides



Hexagon bolt secured in a blind hole



Countersunk secured cylinder bolt



Secured stud bolt

HEICO-LOCK PRODUCT OVERVIEW

M	UNC	STEEL* ITEM NO.	STAINLESS STEEL* ITEM NO.	INTERNAL-Ø [MM]	EXTERNAL-Ø [MM]	BOX QTY [PAIR]
3	#5	HLS-3	HLS-3S	3,4	7,0	200
3,5	#6	HLS-3,5	HLS-3,5S	3,9	7,6	200
3,5	#6	HLB-3,5	HLB-3,5S	3,9	9,0	200
4	#8	HLS-4	HLS-4S	4,4	7,6	200
4	#8	HLB-4	HLB-4S	4,4	9,0	200
5	#10	HLS-5	HLS-5S	5,4	9,0	200
5	#10	HLB-5	HLB-5S	5,4	10,8	200
6		HLS-6	HLS-6S	6,5	10,8	200
6		HLB-6	HLB-6S	6,5	13,5	200
8	5/16"	HLS-8	HLS-8S	8,6	13,5	200
8	5/16"	HLB-8	HLB-8S	8,6	16,6	200
10	-	HLS-10	HLS-10S	10,7	16,6	200
10	-	HLB-10	HLB-10S	10,7	21,0	200
11	7/16"	HLS-11	HLS-11S	11,4	18,5	200
12	-	HLS-12	HLS-12S	13,0	19,5	200
12	-	HLB-12	HLB-12S	13,0	25,4	100
14	9/16"	HLS-14	HLS-14S	15,2	23,0	100
14	9/16"	HLB-14	HLB-14S	15,2	30,7	100
16	5/8"	HLS-16	HLS-16S	17,0	25,4	100
16	5/8"	HLB-16	HLB-16S	17,0	30,7	100
18	-	HLS-18	HLS-18S	19,5	29,0	100
18	-	HLB-18	HLB-18S	19,5	34,5	100
20	-	HLS-20	HLS-20S	21,4	30,7	100
20	-	HLB-20	HLB-20S	21,4	39,0	100
22	7/8"	HLS-22	HLS-22S	23,4	34,5	100
22	7/8"	HLB-22	HLB-22S	23,4	42,0	50
24	-	HLS-24	HLS-24S	25,3	39,0	100
24	-	HLB-24	HLB-24S	25,3	48,5	50
27	-	HLS-27	HLS-27S	28,4	42,0	50
27	-	HLB-27	HLB-27S	28,4	48,5	25
30	1 1/8"	HLS-30	HLS-30S	31,4	47,0	50
30	1 1/8"	HLB-30	HLB-30S	31,4	58,5	25
33	1 1/4"	HLS-33	HLS-33S	34,4	48,5	25
33	1 1/4"	HLB-33	HLB-33S	34,4	58,5	25
36	1 3/8"	HLS-36	HLS-36S	37,4	55,0	25
36	1 3/8"	HLB-36	HLB-36S	37,4	63,0	25
39	1 1/2"	HLS-39	HLS-39S	40,4	58,5	25
42	-	HLS-42	HLS-42S	43,2	63,0	25
	1/4"	HLS-1/4"	HLS-1/4"S	7,2	11,5	200
	1/4"	HLB-1/4"	HLB-1/4"S	7,2	13,5	200
	3/8"	HLS-3/8"	HLS-3/8"S	10,3	16,0	200
	3/8"	HLB-3/8"	HLB-3/8"S	10,3	21,0	200
	1/2"	HLS-1/2"	HLS-1/2"S	13,5	19,5	200
	1/2"	HLB-1/2"	HLB-1/2"S	13,5	25,4	100
	3/4"	HLS-3/4"	HLS-3/4"S	20,0	30,7	100
	3/4"	HLB-3/4"	HLB-3/4"S	20,0	39,0	100
	1"	HLS-1"	HLS-1"S	27,9	39,0	100
	1"	HLB-1"	HLB-1"S	27,9	48,5	50

* Steel un-alloyed, Stainless Steel A4

HEICO GROUP

Since 1900, the HEICO Group has been providing reliable and high-quality solutions in the field of fastening technology and can thus draw on over 100 years of expertise. With more than 350 employees, the company manufactures a wide range of products, which are distributed worldwide via nine company-owned premises.



HEICO Fasteners UK Ltd.

Sirdar Road, Rayleigh
Essex SS6 7XF, United Kingdom

Tel. +44 1268 745421
Fax +44 1268 745467

www.heico-lock.co.uk
sales@heico-fasteners.co.uk

**MADE IN
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HEICO-LOCK®

WEDGE LOCK NUT

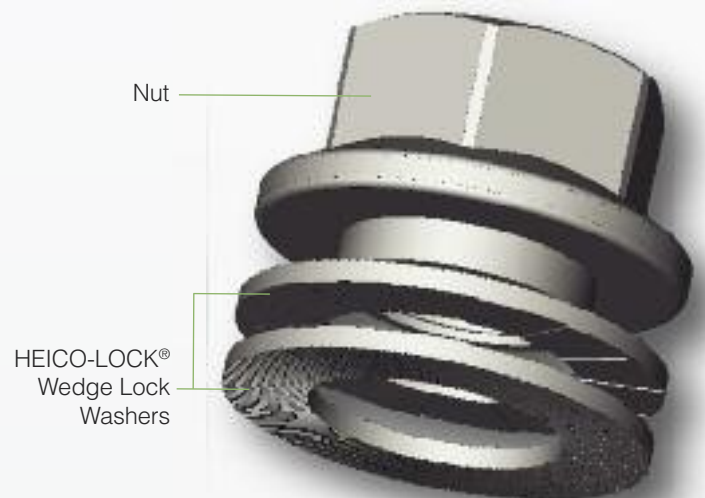
HEICO-LOCK® WEDGE LOCK NUT



The HEICO-LOCK® Wedge Lock Nut provides a high-quality, user-friendly bolt securing system for the most demanding of applications and is ideal for repeated use. The captive and rotary combination of the nut and the original HEICO-LOCK® Wedge Lock Washers makes securing your bolted joints more efficient, effective and easier even under the most extreme vibrations and dynamic loads.

DESIGN OF THE WEDGE LOCK NUT

The HEICO-LOCK® Wedge Lock Nut is supplied pre-assembled. The nut and the HEICO-LOCK® Wedge Lock Washers are combined in a captive and rotary way, ensuring the HEICO-LOCK® Wedge Lock Washers and the nut are fixed permanently in the correct position with the wedge lock washers securing your bolted joint using the proven HEICO-LOCK® principle without loss of quality or function.



ADVANTAGES FOR YOU

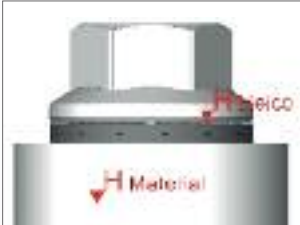
- The one piece design eliminates the risk of misuse.
- Minimized risk of operating and production breakdowns caused by faulty bolted connections
- Easy handling especially in hard to reach locations
- Fixed permanently in the correct position
- Reduction of assembly time and effort
- Reduced complexity of the component due to less individual parts
- Easy, safe and fast installation even for non-specialist users
- Can be re-used without any reduction in function or quality

TECHNICAL SPECIFICATIONS



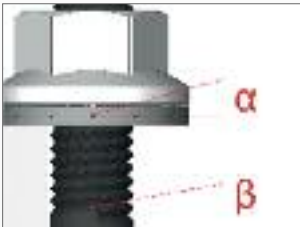
1. Pre-assembled locking system

- The HEICO-LOCK® Wedge Lock Nut is supplied pre-assembled and provides the user the clear benefit of always being in the correct locking position – particularly important if being installed and removed repeatedly



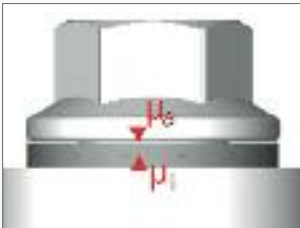
2. Difference in hardness: $H_{HEICO} > H_{Material}$

- The hardness of the mating surfaces should not exceed that of the HEICO-LOCK® Wedge Lock Nut face (class 8, class 10).
 - Steel (through hardened) $485 \pm 25 \text{ HV0.3}$



3. Difference in angles: $\alpha > \beta$

- The wedge angle (α) between the HEICO-LOCK® Wedge Lock Washers is greater than the pitch (β) of the bolt thread
- This angle means the expansion in thickness of the HEICO-LOCK® Wedge Lock Washers is greater than the possible longitudinal movement of the bolt along the thread



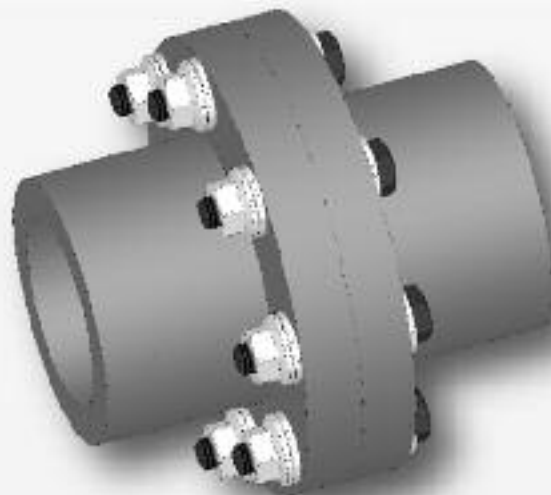
4. Difference in friction: $\mu_a > \mu_i$

- The wedge-shaped surfaces have a considerably lower friction coefficient μ_i than the toothed outside of the washers (friction coefficient μ_a)
- Loosening due to dynamic loads causes movement between the two washers in the region of the wedged shaped surfaces



5. Difference in preload: $F_{dyn} > F_{stat}$

- An expansion in thickness of the HEICO-LOCK® Wedge Lock Washers as a result of loosening leads to an increase in the clamping force
- This causes an increase in the preload compared to the static state and thus causes the bolt to self-lock.



PRODUCT OVERVIEW

M	STEEL ITEM.NO	OUTSIDE DIAMETER [MM]	BOX QUANTITY
6	HLM-6	14,2	100
8	HLM-8	17,9	100
10	HLM-10	21,8	50
12	HLM-12	26,0	50
16	HLM-16	34,5	25
20	HLM-20	42,8	10
22	HLM-22	46,5	10

FINE THREAD	STEEL ITEM.NO	OUTSIDE DIAMETER [MM]	BOX QUANTITY
20 x 1.5	HLM-20x1.5	42,8	1 / 10
22 x 1.5	HLM-22x1.5	46,5	1 / 10

FIELDS OF APPLICATION



ENERGY



RAILWAY



CONSTRUCTION



AUTOMOTIVE



HEICO-LOCK® WHEEL NUT



Also from Heico Fasteners UK the HEICO-LOCK® Wheel Nut is the reliable solution to the problem of self-loosening of wheel nuts on both roads and rough terrain. The captive and rotary combination of the nut and the established HEICO-LOCK® Wedge Lock Washers provides ideal protection for securing your wheels.



MORE INFORMATION: WWW.HEICO-LOCK.CO.UK

HEICO-GROUP

Since 1900, the HEICO Group has been providing reliable and high-quality solutions in the field of fastening technology and can thus draw on over 100 years of expertise. With more than 400 employees, the company manufactures a wide range of products which are distributed via our branches located throughout the world. Our global customer services and in-house laboratories offer a high level of technical advice as well as individual testing facilities.



HEICO Fasteners UK Ltd.

6 Eldon Way, Hockley
Essex. SS5 4AD, United Kingdom

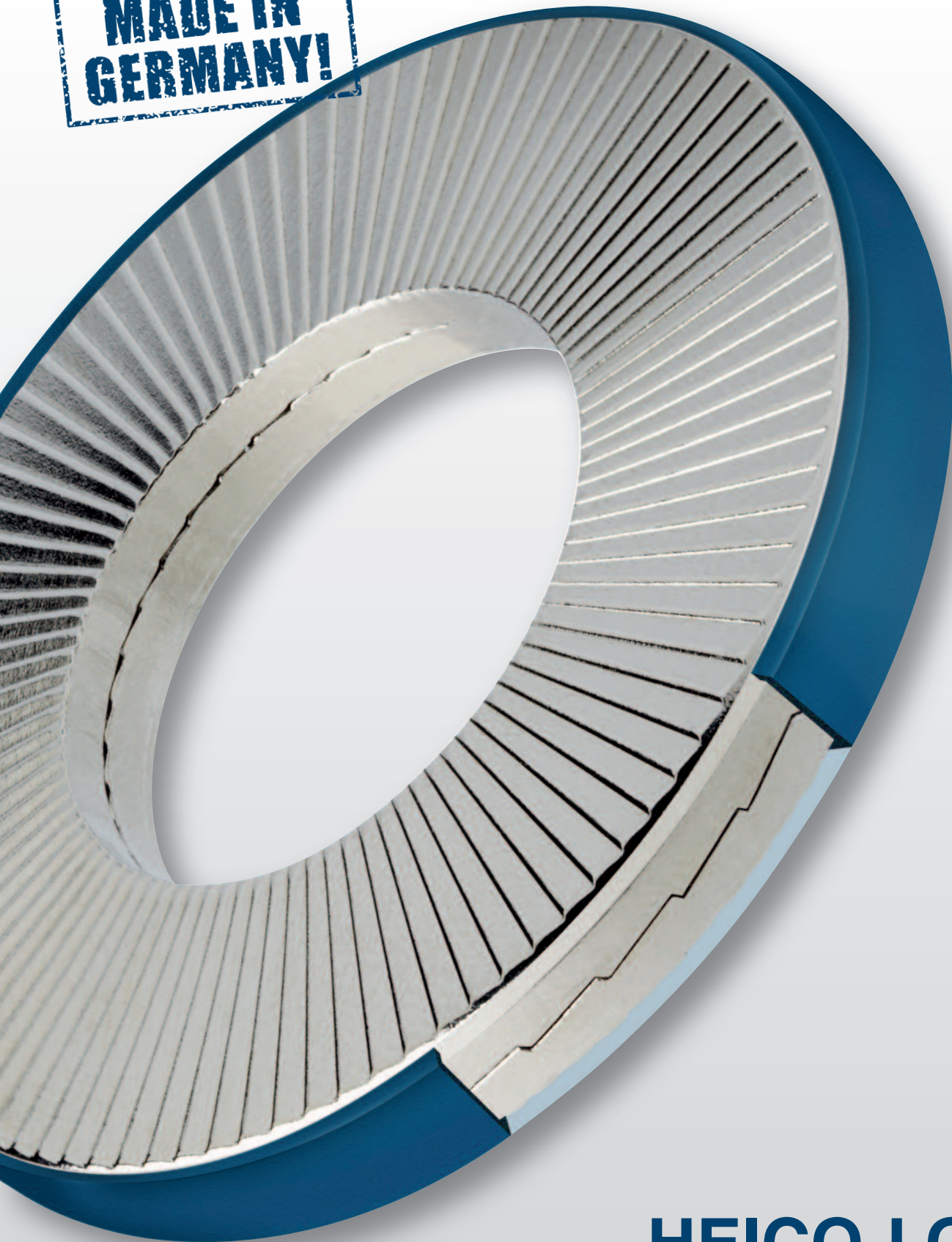
Tel. +44 1268 745421

Fax +44 1268 745467

www.heico-lock.co.uk

sales@heico-fasteners.co.uk

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HEICO-LOCK

RING LOCK WASHERS

THE INNOVATIVE SYSTEM WITH ADDED SECURITY



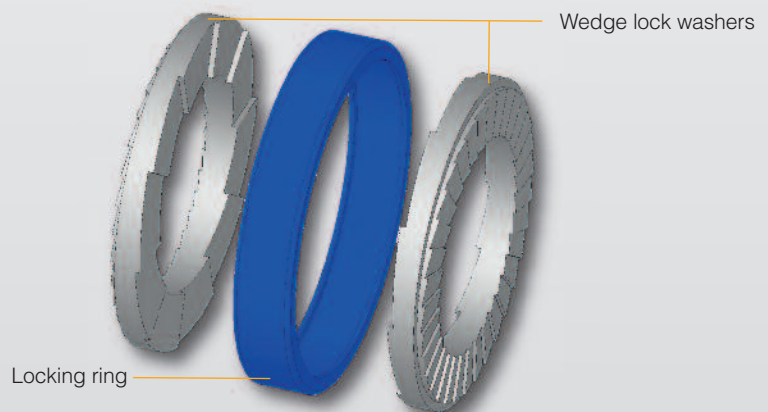
HEICO-LOCK ring lock washers provide high-quality, user-friendly bolt securing for the most demanding of applications and are ideal for repeated use. The ring locking system guarantees that the two wedge lock washers are always fastened in the correct position with the wedge shaped cams on the inside and the radial teeth on the outside. This means that the bolt locking system is always easy, safe and quick to install, even for non-specialist users.

DESIGN OF THE RING LOCKING SYSTEM

HEICO-LOCK ring lock washers are supplied pre-assembled.

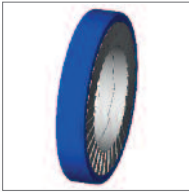
The ring locking system consists of a polyamide ring (PA) and the already familiar HEICO-LOCK wedge lock washers.

Whereas the wedge lock washers secure the bolted connections reliably, the ring holds the two individual washers together in the correct position permanently.



- Very easy to install and remove (ring locking system is supplied pre-assembled)
- Proven system for securing bolts, at high as well as low preloads
- Particularly suitable for dynamic loads – including when lubricants are used
- Reusable with no reduction in quality or convenience
- Also suitable for use with high-tensile bolts of 8.8, 10.9 and 12.9 and their respective nuts
- Available in steel or stainless steel with a narrow or wide bearing surface

TECHNICAL SPECIFICATIONS



1. Pre-assembled locking system

- HEICO-LOCK ring lock washers are supplied pre-assembled and offer the user the clear benefit of always being in the correct locking position – particularly important if being installed and removed repeatedly



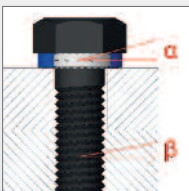
2. Polyamide ring

- The plastic ring on HEICO-LOCK ring lock washers is made from polyamide (PA)
- Other materials can be used for specific applications on request



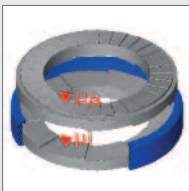
3. Difference in hardness: $H_{HEICO} > H_{Material}$

- The surface hardness of HEICO-LOCK ring lock washers is greater than that of structural grade and high tensile bolts (8.8, 10.9, 12.9)
 - Steel (through-hardened) $485 \pm 25 \text{ HV0.3}$
 - Stainless steel (surface-hardened) $> 520 \text{ HV0.05}$



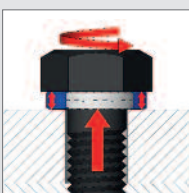
4. Difference in angles: $\alpha > \beta$

- The wedge angle (α) between the HEICO-LOCK ring lock washers is greater than the pitch (β) of the bolt thread
- This angle means the expansion in thickness of the HEICO-LOCK ring lock washers is greater than the possible longitudinal movement of the bolt along the thread



5. Difference in friction: $\mu_a > \mu_i$

- The wedge-shaped surfaces have a considerably lower friction coefficient μ_i than the toothed outside of the washers (friction coefficient μ_a)
- Loosening caused due to dynamic loads causes movement between the two washers in the region of the wedged surfaces



6. Difference in preload: $F_{dyn} > F_{stat}$

- An expansion in thickness of the HEICO-LOCK ring lock washers as a result of loosening leads to an increase in the clamping force
- This causes an increase in the preload compared to when in a static state and thus causes the bolt to self-lock

INSTALLATION EXAMPLES



Hexagon bolt in a through-hole, secured on both sides



Hexagon bolt secured in a blind hole



Countersunk socket head bolt secured in position



No locking function when combined with flat washers

PRODUCT OVERVIEW

M	UNC	STEEL ART. NO.	STAINLESS STEEL ART. NO.	INTERNAL Ø [MM]	EXTERNAL Ø [MM]	PER PACK [PAIRS]
M4	#8	HLRB-4	HLRB-4S	4,4	9,0	200
M5	#10	HLRS-5	HLRS-5S	5,4	9,0	200
M5	#10	HLRB-5	HLRB-5S	5,4	10,8	200
M6	-	HLRS-6	HLRS-6S	6,5	10,8	200
M6	-	HLRB-6	HLRB-6S	6,5	13,5	200
-	1/4"	HLRB-1/4"	HLRB-1/4"S	7,2	13,5	200
M8	5/16"	HLRS-8	HLRS-8S	8,6	13,5	200
M8	5/16"	HLRB-8	HLRB-8S	8,6	16,6	200
M10	-	HLRS-10	HLRS-10S	10,7	16,6	200
M10	-	HLRB-10	HLRB-10S	10,7	19,5	200
M12	-	HLRS-12	HLRS-12S	13,0	19,5	200
M12	-	HLRB-12	HLRB-12S	13,0	25,4	100
-	1/2"	HLRS-1/2"	HLRS-1/2"S	13,5	19,5	200
M14	9/16"	HLRB-14	HLRB-14S	15,2	30,7	100
M16	5/8"	HLRS-16	HLRS-16S	17,0	25,4	100
M16	5/8"	HLRB-16	HLRB-16S	17,0	30,7	100
-	3/4"	HLRS-3/4"	HLRS-3/4"S	20,0	30,7	100
-	3/4"	HLRB-3/4"	HLRB-3/4"S	20,0	39,0	50
M20	-	HLRS-20	HLRS-20S	21,7	30,7	100
M20	-	HLRB-20	HLRB-20S	21,7	39,0	50
M24	-	HLRS-24	HLRS-24S	25,3	39,0	50
-	1"	HLRS-1"	HLRS-1"S	27,9	39,0	50

Non-standard sizes and special materials on request

For a wider range of products, we recommend our HEICO-LOCK wedge lock washers.

APPLICATIONS



HEICO GROUP

The HEICO Group has been providing reliable, high-quality solutions in the field of fastening technology since 1900. With around 350 employees, the company manufactures a wide range of products, which are sold via our branches located throughout the world, as well as by other suppliers. Our global customer services and in-house laboratories offer a high level of technical advice as well as individual testing facilities.



HEICO Fasteners UK Ltd.

6 Eldon Way, Hockley
Essex. SS5 4AD, United Kingdom

Tel. +44 1268 745421
Fax +44 1268 745467

www.heico-lock.co.uk
sales@heico-fasteners.co.uk