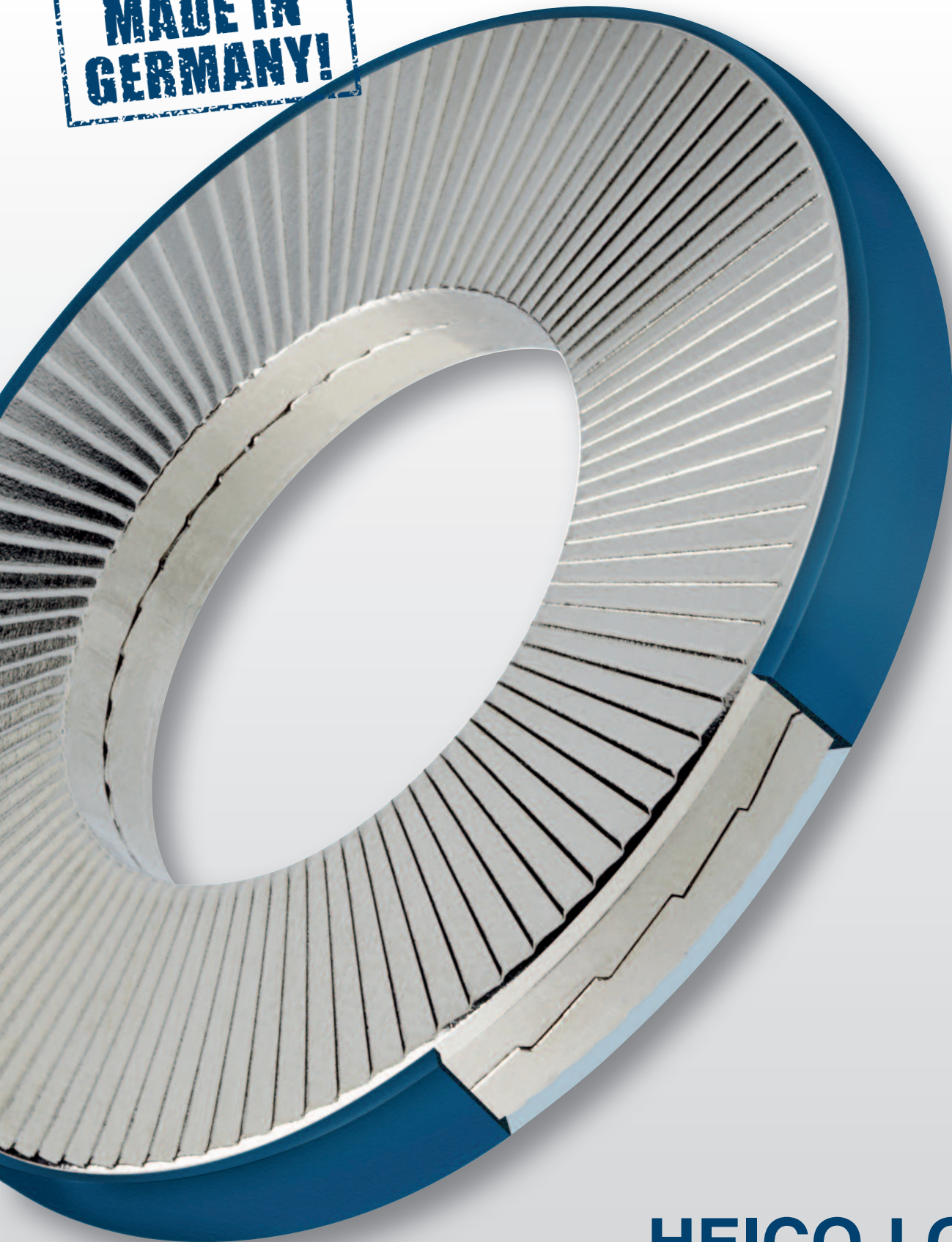


**MADE IN  
GERMANY!**



# **HEICO-LOCK**

## **RING LOCK WASHERS**

## THE INNOVATIVE SYSTEM WITH ADDED SECURITY



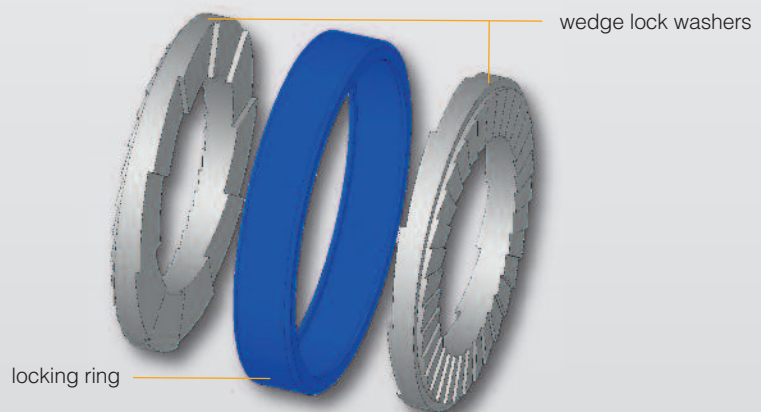
**HEICO-LOCK ring lock washers provide high-quality, user-friendly bolt securing for the most demanding of applications and are ideal for repeated use. The ring locking system guarantees that the two wedge lock washers are always fastened in the correct position with the wedge shaped cams on the inside 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.

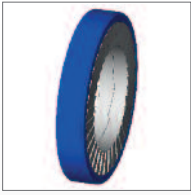
Whereas the wedge lock washers secure the bolted connections reliably, the ring holds the two individual washers together in the correct position permanently.



- 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



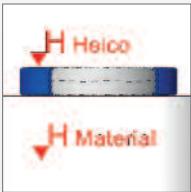
### 1. Pre-assembled locking system

- 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



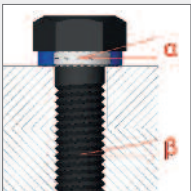
### 2. Polyamide ring

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



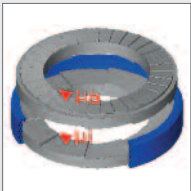
### 3. Difference in hardness: $H_{HEICO} > H_{Material}$

- 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 ( $\alpha$ ) between the HEICO-LOCK ring lock washers is greater than the pitch ( $\beta$ ) 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  $\mu_i$  than the toothed outside of the washers (friction coefficient  $\mu_a$ )
- 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

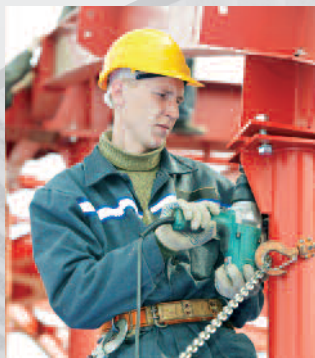
## PRODUCT OVERVIEW

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.



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