

# **HEICO-LOCK**

## WEDGE LOCK WASHERS

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**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

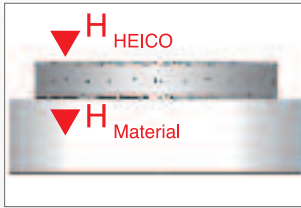
## FUNCTIONAL PRINCIPLE



**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



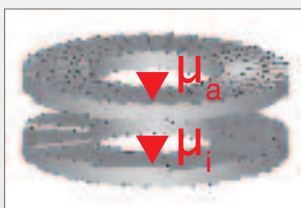
## 1. Difference in hardness: $H_{HEICO} > H_{Material}$

- 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 ±25 HV0.3  
Stainless steel (surface-hardened) > 520 HV0.05



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

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



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