Simple

Fast

Reliable

HEICO-TEC
TENSION NUT

HEICO BEFESTIGUNGSTECHNIK

HEICO-TEC TENSION NUT

SIMPLE · FAST · RELIABLE

For a secure joint with a HEICO-TEC tension nut, no electric, hydraulic, or pneumatic tools are needed. All you need is a torque wrench.

The HEICO-TEC tension nut is unique in the fact that the pre-tension force of the large main thread is distributed to many smaller pressure bolts. Because the pressure bolts are smaller, a conventional torque wrench can be used to achieve the proper pretension force.

This eliminates the need for complex, bulky, or heavy tools and makes securing large bolted joints more convenient and easy.

COMPATIBLE WITH DIN EN ISO 898-2

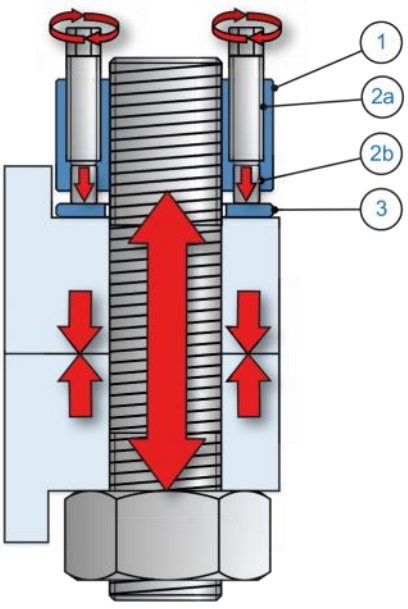
HEICO-TEC tension nuts meet all the requirements of ISO 898-2 which enables you to easily replace any hex nut from the same strength class while also offering all the advantages of a hand-tightened nut.

DESIGN AND FUNCTION

1. The nut body ① is screwed onto the main thread just like a conventional nut – but is not tightened.

2. Several pressure bolts ②a with associated pressure pins ②b are arranged around the main thread inside the nut body. When the pressure bolts are tightened, they push the pressure pins against the part to be tensioned and at the same time the screws elongate. The pre-tension force created in this way is purely axial and therefore free from harmful torsion or bending.

3. The hardened disk ③ protects the tensioned parts from high pressure loads caused by the pressure pins.



ADVANTAGES OF **HEICO-TEC**

SIMPLE
A hand-held torque wrench is all you need for tightening and loosening. No special tools are required. This makes maintenance easier.

FAST
Manual pre-tensioning saves on the transport and set-up times that would be required by special tools. HEICO-TEC tension nuts are often already tightened in the time it takes to set up electric, hydraulic or pneumatic tools

RELIABLE
The pressure pins act like springs and increase the flexibility of the bolted joint. This compensates for settlement of the joint, thus preserving pre-load.

SAFE
With the inherent mechanical flexibility of the HEICO-TEC design, the bolted joint performs as if it has a greater clamping length, making it highly resistant to loosening forces.

DURABLE
The greater flexibility reduces the bolted joint's dynamic stress, thus increasing its service life.

PRECISE
Controlled friction characteristics ensure the highest tightening and repeat accuracy – guaranteed and confirmed by DNV GL.

REUSABLE
Because the HEICO-TEC assembly is not damaged during tightening and loosening, the HEICO-TEC tension nuts are reusable.

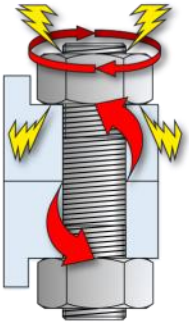
COMPATIBLE
HEICO-TEC tension nuts comply with all ISO 898-2 requirements. You can directly replace any conventional nut from the same strength class.

ECONOMICAL
Our efficient and high volume manufacturing process means that we can transfer the cost benefits directly to our customers.

HEICO-TEC THE BETTER ALTERNATIVE

Compared with conventional methods, HEICO TEC tension nuts offer considerable advantages for tensioning large bolted joints quickly, simply and reliably.

PHYSICS OF BOLT TENSIONING PROCESS



Due to the inclined plane of the bolt threads, the turning movement of bolt tightening results in axial elongation and pre-load of the bolt.

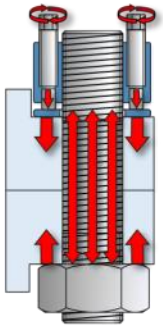
Problems:

- Threads are deformed even when proper lubrication is applied.
- The deformation of the threads reduces the pre-load, durability, and reusability of the bolt.
- The torsion stress from thread friction and deformation reduces the axial load-bearing capacity of the bolt.

ADVANTAGES OF **HEICO-TEC**

No torsion stress. Because the stress on the bolt is purely axial, the capacity of the bolt can be fully utilized.

THE HYDRAULIC TENSIONING PROCESS



When tightening a bolt with a hydraulic cylinder, the bolt is elongated and the nut is then tightened free of load. When the hydraulic pressure is released, the bolt contracts, resulting in the proper tension on the bolt.

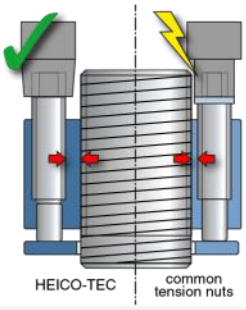
Problem:

As the nut was not pre-tensioned while the bolt was elongated, a percentage of the elongation of the bolt is lost in joint settlement. Only two thirds of the bolt strength can be utilized.

ADVANTAGES OF **HEICO-TEC**

Losses from settlement of the joint do not occur and full capacity of the joint is achieved.

TENSION NUTS WITH PRESSURE SCREWS PROCESS



In the case of tension nuts with pressure screws, the pressure screws are arranged closer to the bolt thread and have a smaller hexagon head.

Problems:

- With less space to maneuver in, this tensioning system results in higher cost due to the need for special thin-walled socket and wrench.
- Typically, this tension system is not as strong as standard hex nuts. In this case, standard tension nuts with pressure bolts cannot replace commercial hex nuts.

ADVANTAGES OF **HEICO-TEC**

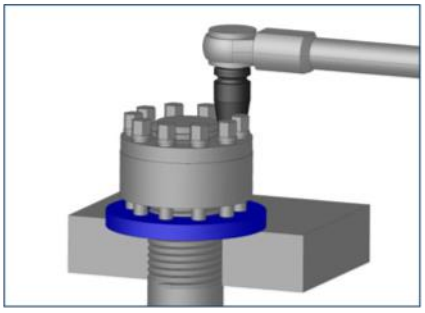
Nuts can be installed with standard industrial-quality wrenches.

HEICO-TEC ASSEMBLY TEMPLATE

Assembly is fast and simple with HEICO-TEC tension nuts. In addition to assembly instructions, an assembly template is also available for the standard product range. The template helps installers tighten the pressure bolts correctly. The template is attached to the tension nut. The pressure bolts are tightened in sequence, according to a color system: For example, first the orange-colored then the blue and finally the white. This cycle is repeated until the torque wrench indicates the required tightening torque is achieved.

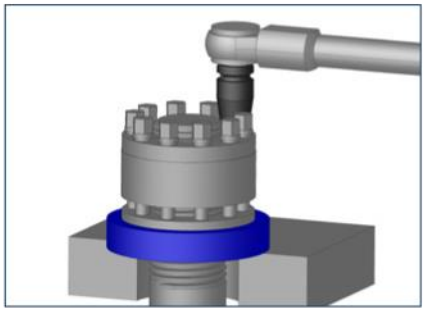
For easy documentation, the required tightening torque can be noted on the template. This template can be archived with the date as proof the procedure was done properly.

ASSEMBLY INSTRUCTIONS



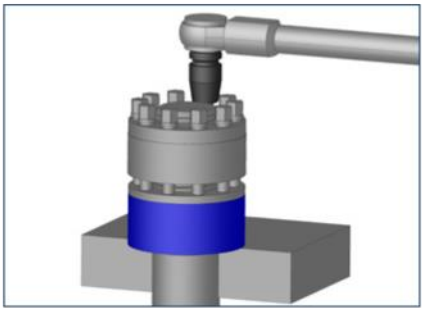
Soft Materials

Soft materials (e.g. aluminum) or sensitive surfaces require the use of a larger and thicker disk. Heico can provide these disks on request.



Large Holes or Slots

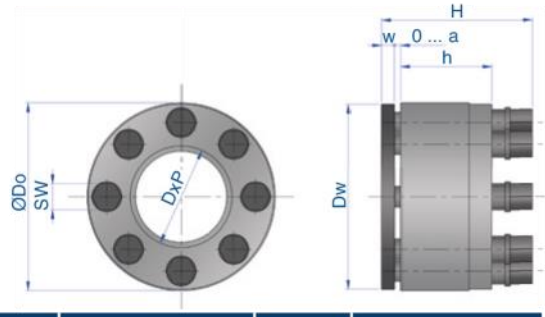
The disk must be fully supported under the pressure pins, otherwise, the disk could bend or break. In the case of large holes or slots, an additional supporting disk must be used.



Protruding Bolt Ends

If the bolt ends protrudes too far through the joint, an additional spacer disk can be provided to position the HEICO-TEC tension nut properly.

HEICO-TEC PRODUCT OVERVIEW



STRENGTH CLASS 8

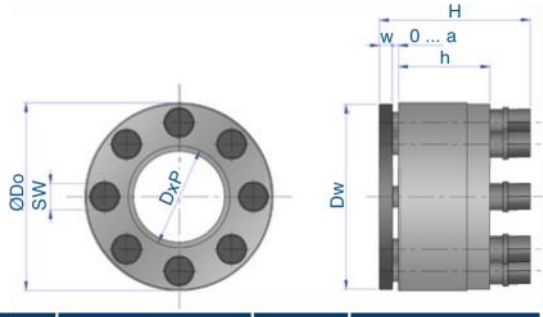
type	nut body			pressure bolts		washer		tension nut		torque	preload	
HTM-DxP/8	thread DxP	outer-Ø D_0 mm	height h mm	quantity n	wrench/ socket size. SW mm	Ø D_w mm	thickness w mm	total height H mm	tensioning stroke a mm	nominal* M_A Nm	nominal** F_{Vnom} kN	maximum*** F_{Vmax} kN
HTM-M30x3,5/8	M30x3,5	56	28	9	8	55	5	50	5,5	47	305	360
HTM-M33x3,5/8	M33x3,5	59	28	10	8	58	5	50	5,5	52	375	445
HTM-M36x4/8	M36x4	69	35	7	10	68	5	60	7,5	97	440	525
HTM-M39x4/8	M39x4	72	35	8	10	71	5	60	7,5	101	525	625
HTM-M42x4,5/8	M42x4,5	75	35	9	10	74	5	60	7,5	105	615	720
HTM-M45x4,5/8	M45x4,5	84	42	8	12	83	6	73	9,5	150	710	840
HTM-M48x5/8	M48x5	87	42	9	12	86	6	73	9,5	150	800	945
HTM-M52x5/8	M52x5	91	42	10	12	90	6	73	9,5	155	930	1125
HTM-M56x5,5/8	M56x5,5	102	52	8	14	101	8	87	10,5	270	1090	1300
HTM-M60x5,5/8	M60x5,5	106	52	9	14	105	8	87	10,5	280	1275	1500
HTM-M64x6/8	M64x6	110	52	10	14	109	8	87	10,5	280	1420	1665
HTM-M68x6/8	M68x6	120	64	9	16	119	8	104	12,5	335	1640	1930
HTM-M72x6/8	M72x6	124	64	10	16	123	8	104	12,5	340	1850	2145
HTM-M76x6/8	M76x6	128	64	12	16	127	8	104	12,5	320	2085	2490

* Tightening torque for each pressure bolt. Tightening torque and pre-load are proportional, i.e. half the tightening torque results in half the pre-load.
** approx. 2/3 of the ultimate tensile load of the bolt from strength class 8.8
*** approx. elasticity limit of a bolt from strength class 8.8

HEICO-TEC tension nuts are available in sizes from M30 to M76. Strength classes comply with ISO 898-2. Other strength classes, bolt sizes, thread types, and thread pitches are available on request. All HEICO-TEC tension nuts can be ordered with a zinc coating to ensure greater protection against corrosion. Additional corrosion-resistant coatings and alloys are available on request.

For more information about HEICO-TEC tension nuts, visit **www.heico-tec.de/downloads**

HEICO-TEC PRODUCT OVERVIEW



STRENGTH CLASS 10

type	nut body			pressure bolts		washer		tension nut		torque	preload	
HTM-DxP/10	thread DxP	outer-Ø D_0 mm	height h mm	quantity n	wrench/ socket size. SW mm	Ø D_w mm	thickness w mm	total height H mm	tensioning stroke a mm	nominal* M_A Nm	nominal** F_{Vnom} kN	maximum*** F_{Vmax} kN
HTM-M30x3,5/10	M30x3,5	56	28	12	8	55	5	50	5,5	49	425	505
HTM-M33x3,5/10	M33x3,5	66	33	8	10	65	5	56	5,5	100	520	625
HTM-M36x4/10	M36x4	69	35	10	10	68	5	60	7,5	95	615	740
HTM-M39x4/10	M39x4	72	35	12	10	71	5	60	7,5	94	730	880
HTM-M42x4,5/10	M42x4,5	81	40	10	12	80	6	69	7,5	140	830	1010
HTM-M45x4,5/10	M45x4,5	84	42	11	12	83	6	73	9,5	150	975	1180
HTM-M48x5/10	M48x5	88	42	12	12	87	6	73	9,5	155	1100	1330
HTM-M52x5/10	M52x5	98	50	11	14	97	8	84	9,5	235	1305	1585
HTM-M56x5,5/10	M56x5,5	102	52	12	14	101	8	87	10,5	250	1515	1830
HTM-M60x5,5/10	M60x5,5	110	52	13	14	109	8	87	10,5	270	1775	2130
HTM-M64x6/10	M64x6	116	60	12	16	115	8	100	12,5	310	2020	2420
HTM-M68x6/10	M68x6	120	64	13	16	119	8	104	12,5	325	2295	2750
HTM-M72x6/10	M72x6	134	64	12	18	133	10	103	12,5	505	2600	3120
HTM-M76x6/10	M76x6	138	72	13	18	137	10	112	13,5	525	2925	3510

* Tightening torque for each pressure bolt. Tightening torque and pre-load are proportional, i.e. half the tightening torque results in half the pre-load.
** approx. 3/4 of the ultimate tensile load of a bolt from strength class 10.9
*** approx. elasticity limit of a bolt from strength class 10.9

HEICO-LOCK® WEDGE LOCK WASHERS

In addition to HEICO-TEC tension nuts, HEICO manufactures HEICO-LOCK® "wedge lock" washers. The special tension-based design of the washers are used in demanding bolted joint applications where high dynamic loads, constant vibration, thermal cycling, and potential low pre-load conditions exist. For further information about the HEICO-LOCK® products, visit **www.heico-lock.com**

EXCELLENT **HEICO** QUALITY

FAST IMPLEMENTATION OF YOUR CONCEPT

When you work with HEICO, everything is provided from one source: bolted joint product development, testing in our own laboratory, engineering, bolted joint expertise, and ISO/TS 16949 production quality.

The company's versatility ensures flexible processes and makes fast reaction and delivery times possible. HEICO's employees provide the customer with sophisticated solutions, whether for standard projects or specific concepts.

OUR EFFICIENT AND HIGH QUALITY MANUFACTURING FOR YOUR BENEFIT

HEICO customers benefit from an attractive service package. The company is able to transfer the cost advantages of this to its customers thanks to its extremely high real net output ratio.

Optimized processes also create the economic conditions for making standard products available from stock. Even the manufacture of HEICO-TEC pressure bolts and pressure pins on high-performance multi-stage presses in cold or warm forming processes is possible.

A STRONG GROUP BEHIND A STRONG PRODUCT

The HEICO group, based in the town of Ense in Westphalia, Germany, is a family-owned business with a long tradition. The company has been working passionately in the field of fastening technology since 1900. HEICO operates internationally with company sites based in over a dozen locations throughout the world. The group offers the highest degree of technical support and individual testing options.

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