

Simple  
Fast  
Reliable



**HEICO-TEC®**  
TENSION NUT



# 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 pretension 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 correct pretension force.

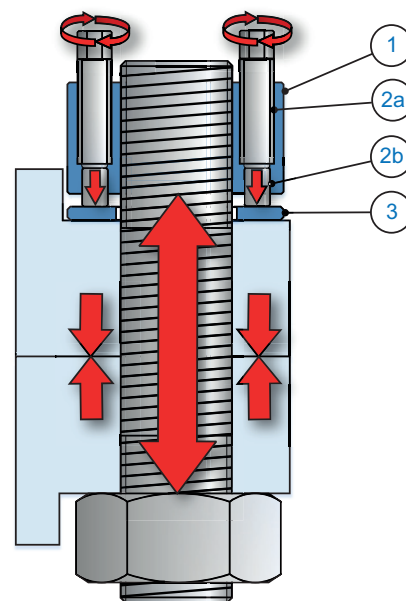
This eliminates the need for complex, bulky, or heavy tools and makes securing large bolted joints more convenient and easy.

## 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 bolt elongates. The pretension force created in this way is purely axial and therefore free from harmful torsion or bending.
3. The hardened incorporated load bearing washer 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 far easier.



### **FAST**

Manual pretensioning saves on the transport and set-up times that would be required by special tools. HEICO-TEC® Tension Nuts are often tightened in the same 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 preload.



### **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**

As 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

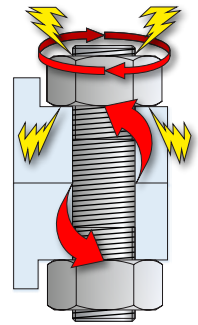
Compared with conventional methods, HEICO-TEC® Tension Nuts offer considerable advantages for tensioning large bolted joints quickly, simply and reliably.

## 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 preload of the bolt.

### Problems:

- Threads are deformed even when proper lubrication is applied.
- The deformation of the threads reduces the preload, 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®

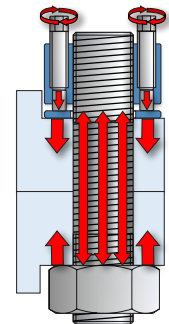
No torsion stress. As the stress on the bolt is purely axial, the capacity of the bolt can be fully utilized.

## 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 pretensioned 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®

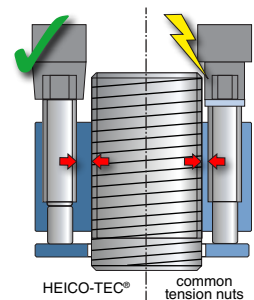
Losses from settlement of the joint do not occur and full capacity of the joint is achieved.

## TENSION NUTS WITH PRESSURE BOLTS PROCESS

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

### Problems:

- With less space to maneuver, this tensioning system results in higher costs due to the need for a 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.

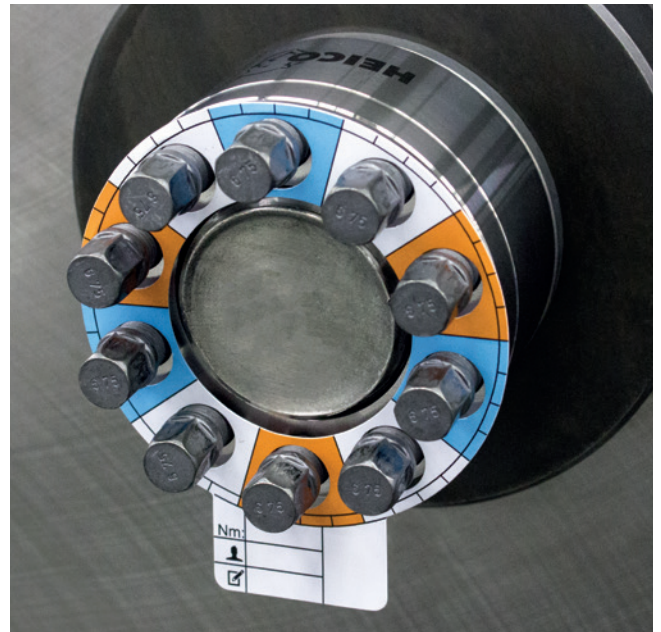
# HEICO MAKES IT EASY

## HEICO-TEC® ASSEMBLY TEMPLATE

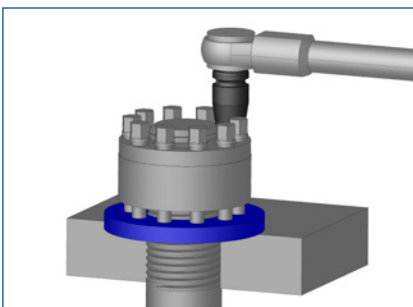
Assembly is fast and simple with HEICO-TEC® Tension Nuts. In addition to assembly instructions, an assembly template is also available for the standard product range.

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 colour system: For example, first the orange-coloured 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 carried out correctly.

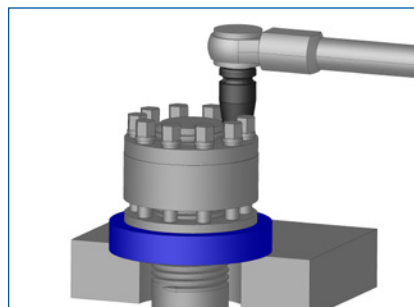


## ASSEMBLY INSTRUCTIONS



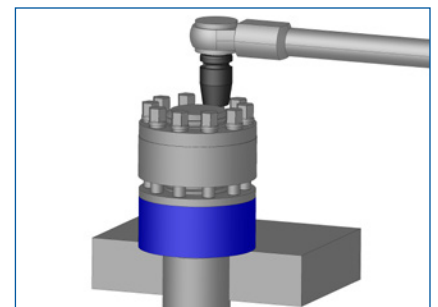
### Soft Materials

The use of a larger and thicker incorporated load spreading washer will be required for use with soft materials (e.g. aluminum) or sensitive surfaces. HEICO can provide these incorporated washers on request.



### Large Holes or Slots

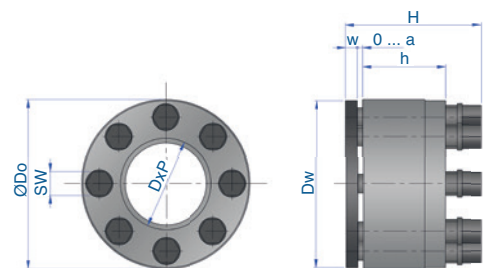
The incorporated washer must be fully supported under the pressure pins, otherwise the washer could bend or break. In the case of large holes or slots, an additional supporting incorporated washer must be used.



### Protruding Bolt Ends

If the bolt ends protrude too far through the joint an additional incorporated washer 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 <sub>o</sub> mm	height h mm	quantity n	wrench/ socket size, SW mm	Ø D <sub>w</sub> mm	thickness w mm	total height H mm	tensioning stroke a mm	nominal* M <sub>n</sub> Nm	nominal** F <sub>vinom</sub> kN	maximum*** F <sub>vinax</sub> kN
HTM-M20x2,5/8	M20x2,5	40	20	7	6	39	4	37	4,5	12	125	160
HTM-M22x2,5/8	M22x2,5	42	20	8	6	41	4	37	4,5	14	165	190
HTM-M24x3/8	M24x3	44	20	10	6	43	4	37	4,5	13	195	225
HTM-M27x3/8	M27x3	50	24	8	7	49	4	42	5	24	245	285
HTM-M30x3,5/8	M30x3,5	56	28	9	8	55	5	50	5,5	30	300	360
HTM-M33x3,5/8	M33x3,5	59	28	10	8	58	5	50	5,5	33	365	445
HTM-M36x4/8	M36x4	69	35	7	10	68	5	60	7,5	70	440	525
HTM-M39x4/8	M39x4	72	35	8	10	71	5	60	7,5	73	525	625
HTM-M42x4,5/8	M42x4,5	75	35	9	10	74	5	60	7,5	74	600	720
HTM-M45x4,5/8	M45x4,5	84	42	8	12	83	6	73	9,5	115	685	840
HTM-M48x5/8	M48x5	87	42	9	12	86	6	73	9,5	120	805	945
HTM-M52x5/8	M52x5	91	42	10	12	90	6	73	9,5	125	930	1125
HTM-M56x5,5/8	M56x5,5	102	52	8	14	101	8	87	10,5	205	1095	1300
HTM-M60x5,5/8	M60x5,5	106	52	9	14	105	8	87	10,5	210	1260	1500
HTM-M64x6/8	M64x6	110	52	10	14	109	8	87	10,5	215	1435	1665
HTM-M68x6/8	M68x6	120	64	9	16	119	8	104	12,5	315	1645	1930
HTM-M72x6/8	M72x6	124	64	10	16	123	8	104	12,5	320	1855	2145
HTM-M76x6/8	M76x6	128	64	12	16	127	8	104	12,5	300	2090	2490
HTM-M80x6/8	M80x6	132	76	13	16	131	8	116	12,5	310	2340	2780
HTM-M85x6/8	M85x6	137	76	15	16	136	8	116	12,5	305	2655	3170
HTM-M90x6/8	M90x6	149	88	13	18	148	10	130	12,5	445	3005	3580
HTM-M95x6/8	M95x6	154	88	15	18	153	10	130	12,5	430	3350	4020
HTM-M100x6/8	M100x6	159	88	16	18	158	10	130	12,5	450	3740	4480
HTM-M105x6/8	M105x6	170	100	14	20	169	10	147	14,5	635	4165	4965
HTM-M110x6/8	M110x6	175	100	15	20	174	10	147	14,5	650	4570	5400
HTM-M115x6/8	M115x6	186	112	17	20	185	10	159	14,5	630	5020	6015
HTM-M120x6/8	M120x6	195	112	18	20	194	10	159	14,5	655	5525	6490
HTM-M125x6/8	M125x6	203	124	14	21	202	12	176	18,5	785	6000	7125
HTM-M130x6/8	M130x6	208	124	16	21	207	12	176	18,5	745	6510	7775
HTM-M140x6/8	M140x6	215	124	18	21	214	12	176	18,5	770	7600	9075
HTM-M150x6/8	M150x6	236	139	20	21	235	12	191	18,5	800	8775	10190
HTM-M160x6/8	M160x6	272	139	23	21	271	12	191	18,5	800	10030	11735

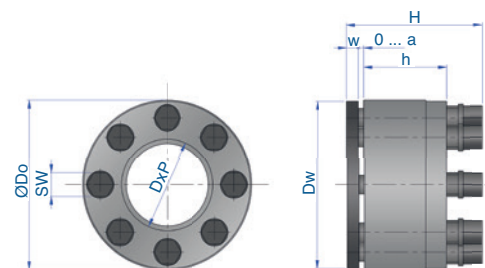
\* Tightening torque for each pressure bolt. Tightening torque and preload are proportional, i.e. half the tightening torque results in half the preload.

\*\* 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® PRODUCT OVERVIEW



## STRENGTH CLASS 10

type	nut body						pressure bolts		washer		tension nut		torque	preload	
HTM-DxP/10	thread D	pitch P			outer-Ø D <sub>0</sub> mm	height h mm	quantity n	wrench/ socket size: SW mm	Ø D <sub>w</sub> mm	thickness w mm	total height H mm	tensioning stroke a mm	nominal* M <sub>A</sub> Nm	nominal** F <sub>Vnom</sub> kN	maximum*** F <sub>Vmax</sub> kN
HTM-M20x.../10	M20	2,5	2	1,5	40	20	10	6	39	4	37	4,5	12	180	220
HTM-M22x.../10	M22	2,5	2	1,5	42	20	12	6	41	4	37	4,5	13	235	265
HTM-M24x.../10	M24	3	2	1,5	46	24	9	7	45	4	42	5	22	260	320
HTM-M27x.../10	M27	3	2	1,5	50	24	12	7	49	4	42	5	22	350	410
HTM-M30x.../10	M30	3,5	2	1,5	56	28	12	8	55	5	50	5,5	31	425	505
HTM-M33x.../10	M33	3,5	2	1,5	66	33	8	10	65	5	56	5,5	70	515	625
HTM-M36x.../10	M36	4	3	1,5	69	35	10	10	68	5	60	7,5	67	620	740
HTM-M39x.../10	M39	4	3	1,5	72	35	12	10	71	5	60	7,5	66	725	880
HTM-M42x.../10	M42	4,5	3	1,5	81	40	10	12	80	6	69	7,5	110	845	1010
HTM-M45x.../10	M45	4,5	3	1,5	84	42	11	12	83	6	73	9,5	115	975	1180
HTM-M48x.../10	M48	5	3	1,5	88	42	12	12	87	6	73	9,5	120	1110	1330
HTM-M52x.../10	M52	5	3	2	98	50	11	14	97	8	84	9,5	180	1320	1585
HTM-M56x.../10	M56	5,5	4	2	102	52	12	14	101	8	87	10,5	190	1520	1830
HTM-M60x.../10	M60	5,5	4	2	110	52	13	14	109	8	87	10,5	205	1780	2130
HTM-M64x.../10	M64	6	4	2	116	60	12	16	115	8	100	12,5	290	2020	2420
HTM-M68x.../10	M68	6	4	2	120	64	13	16	119	8	104	12,5	305	2300	2750
HTM-M72x.../10	M72	6	4	2	134	64	12	18	133	10	106	12,5	415	2585	3120
HTM-M76x.../10	M76	6	4	2	138	72	13	18	137	10	115	13,5	435	2935	3510
HTM-M80x.../10	M80	6	4	2	147	72	14	18	146	10	115	13,5	450	3270	3910
HTM-M85x.../10	M85	6	4	2	150	84	13	20	149	10	131	14	610	3715	4460
HTM-M90x.../10	M90	6	4	2	160	84	14	20	159	10	131	14	640	4200	5040
HTM-M95x.../10	M95	6	4	2	173	94	11	24	172	12	153	18,5	1090	4700	5560
HTM-M100x.../10	M100	6	4	2	182	94	12	24	181	12	153	18,5	1115	5245	6110

The final type number is generated by substituting the "...“ by the respective thread pitch

\* Tightening torque for each pressure bolt. Tightening torque and preload are proportional, i.e. half the tightening torque results in half the preload.

\*\* 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

The strength classes of the HEICO-TEC® Tension Nuts 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.com/downloads](http://www.heico-tec.com/downloads)



## 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 IATF 16949 production quality.

Our versatile approach ensures flexible processes, making fast reaction and delivery times possible. HEICO's employees provide our customers 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. We are able to transfer cost advantages to our customers thanks to our 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 multiple company sites strategically located throughout the world. The group offers the highest degree of technical support and individual testing options.

