

*SISHT Model*

# Hydraulic Nut

- Can be certainly used to highest pressure **400MPa max.**  
And highest temperature **630deg.C max.**
  - Re-usable on site.
  - High workability
  - Using the patented special designed metal seal
  - Featured by the patented split type lock nut ring
- } 100% maintenance by a User at site  
for the minimum time  
with no expertise nor experience



Lock Nut Ring of  
Two split type  
with the side fastened



Lock Nut Ring of Three split type with the top fastened

## Introductions

*Technoplants Inc.* developed the structure by the new principle of an original super high pressure –metal seal with own experience, and completed several sorts of fastener structures which does not require advanced technique .(---under patent pending).

Before the *Technoplants* Hydraulic Nuts become available in the market, it has been the usual practice to cut the lock nut by grinder at each periodical inspection due to poor seal performance. Especially in a very high temperature application such as the power generation gas turbine, operating its fastners at more than 500deg.C, has experienced more than 50% failure rate. Such a long suffer and fear for the heavy maintenance load is now resolved completely by an epoch–making invention and technology development.

Our SSHT model Nut that is high–temperature proof and super high–pressure proof by patented technology, is in gas turbines of an actual thermal power plant and a gas turbine for test plant.

The following tests were performed for the used nuts.

**The high temperature (max.580°C) test in a furnace.**

**Super–high–pressure (330Mpa) test**

※ above tests were carried out cyclic...

**Maintenance efficiency test.**

**Split typed lock nut removal test.**

The used nuts were removed after operation and again set into the same position, and under normal operation now.

The reason for this reuse is in the seal of a special design. The seal cross–section geometry and slot structure are patented.

If a leak should occur in a seal portion, the self–positioning compensation takes place, and a seal function is restored automatically.

When removing the nut, generally a nut was not able to be loosened if it cannot be pressurized by leak, etc. In this case, there has been no choice but just to cut the lock nut in order to loosen the hydraulic nut body from the bolt.

As for our nut, the lock nut ring is composed by two or three halves. Even in case of seal malfunction, the lock nut under the full load can be split by the hydraulic tool in a few seconds with no damage to components for reuse, where the axial force is releasable easily and instantly.



Complete set of Hydraulic nut



Under testing for pressure (300MPa)

Split the lock nut by oil jack



Split of one side lock nut



Lock nut(split type)

## Applications

The Hydraulic Nut is suitable for use where:

- Accurate and reliable bolt loading is required
- Even bolt loading is essential
- Frequent in-service inspection is required
- Quick and Safe bolting is required
- High temperature application & atmosphere
- Bolting work space is narrow and limited
- Thread seizure is usual trouble
- Relaxation of bolt load by thread creeping

Typical Hydraulic Nut applications are found in many industries, including;

- Power station or generation
- Petro-Chemical Industries
- Marine
- Agricultural
- Structural
- Heavy equipment in general industry

## Features

The Hydraulic Nut provides the following advantages.

- Gives reliable and precise tensioning, completely.
- Improves efficiency and safety on the job.
- No Special-skilled craftsman nor special tool are required for maintenance.
- Reduction of the time and cost for maintenance can be performed.



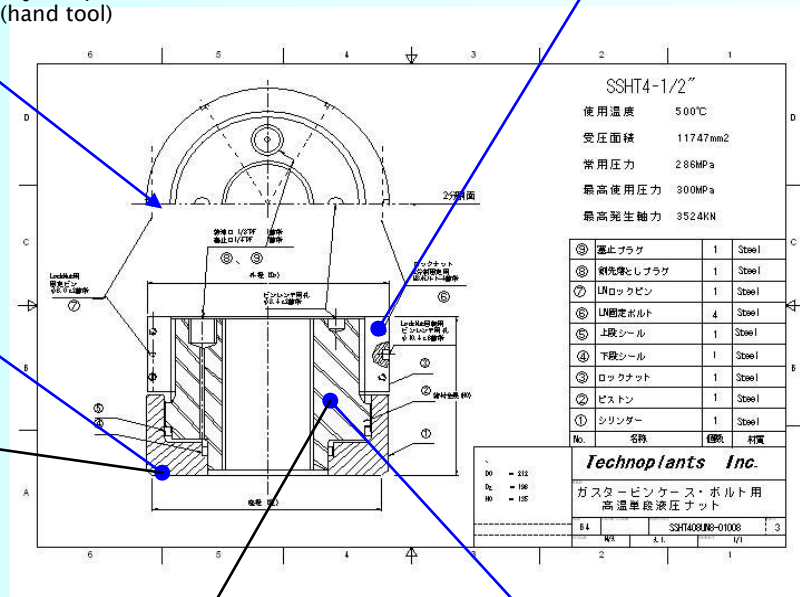
③ Rock Nut (Split half)



Oil jack splitter (hand tool)



① Cylinder



② piston



## Technical Specifications

1. Bolt Size range from M20 to M150 (any size to order per application)
2. Nut OD Size SSHT: Bolt size x1.75–1.9, SSHTL : Bolt size x 2.5–2.8
3. Temperature up to 120deg.C (Elastomer seal), from 120 to 630 deg.C (Metal seal)
4. Max. Pressure up to 270Mpa (Elastomer seal), 100–400Mpa (Metal seal) ,
5. Material JIS S45C, SCM, SNCM, SKD, etc. as per Temperature/Pressure
6. Oil Port Side or Top (Customer to specify.....under M48 side port only as standard)
7. port connection 1/16"PF, 1/8" PF or 1/4" PF

## Other products

\*We produce other new technology fastening products as follows;

\*Double wedged screw Nut (21Nut)

\*SB-Nut (Jacking screws in steel balls)

\*hydraulic or mechnaical Multiplied power SB-Nut

\*Multiplied power (x2–5) Hydraulic Nut

\*Low pressure (70Mpa) Hydraulic Nut

\*Super high pressure (400Mpa) Stacked Nut

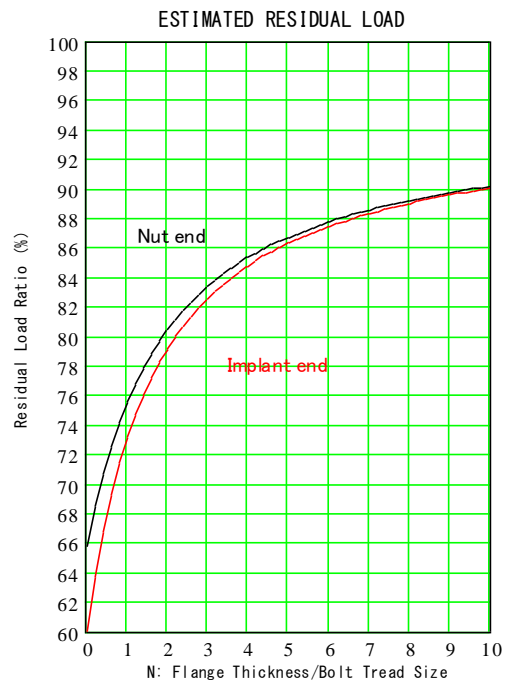
\*Super high pressure (400Mpa) Tensioner

\*Multiplied power (x2–5) tensioner

※ Other products (Custom made hydraulic nuts and tensioners can also be designed / manufactured.)

Hydraulic Nut_Model SSHT/SSHTL							
※ Black letter=:Nut Small Diameter Series(SSHT)							
※ Blue letter=Large Diameter Series(SSHTL)							
Bolt Thread Size (mm)	(inch)	Bolt Thread Pitch (mm)/(tpi)	Max. Force @300MPa (kN)	Nut Dia (mm)	Nut Height (mm)	Piston Stroke (mm)	Nut Weight (kg)
	1"	8	153 420	44.5 64.0	73.5 74.4	5 5	0.9 1.8
M30		3.5	217 597	54.0 77.7	76.3 77.4	5 5	1.0 2.5
	1 1/4"	8	252 692	56.4 81.2	78.7 79.8	5 5	1.5 3.2
M36		4.0	316 869	65.5 94.4	82.4 83.8	5 5	1.7 4.0
	1 1/2"	8	375 1031	68.5 98.9	84.1 85.5	5 5	2.4 5.1
M42		4.5	434 1193	77.3 111.3	94.2 95.7	6 6	2.6 6.4
	1 3/4"	8	523 1438	80.9 116.5	96.3 97.6	6 6	3.8 8.1
M48		5.0	570 1568	89.2 128.5	100.5 102.3	6 6	3.8 9.2
	2"	8	695 1912	93.5 134.7	101.5 103.3	6 6	5.4 11.4
M56		5.5	786 2160	105.0 151.2	107.5 109.2	6 6	5.6 13.6
	2 1/4"	8	892 2453	105.7 152.3	106.9 108.8	6 6	7.3 15.4
	2 1/2"	8	1113 3062	118.0 170.0	113.4 115.6	6 6	9.7 20.4
M64		6.0	1036 2848	121.0 174.2	115.2 117.6	6 6	8.0 19.4
	2 3/4"	8	1359 3738	130.4 187.8	118.6 121.2	6 6	12.3 26.2
M72		6.0	1339 3682	137.0 197.3	128.5 131.2	7 7	11.3 27.8
	3"	8	1630 4481	142.9 205.8	130.8 133.4	7 7	16.3 34.6
M80		6.0	1681 4623	153.2 220.6	135.5 138.3	7 7	14.9 36.6
	3 1/2"	8	2244 6171	168.0 242.0	141.5 144.5	7 7	24.4 51.8
M90		6.0	2164 5950	173.2 249.4	143.9 147.2	7 7	20.2 49.7
M100		6.0	2707 7444	193.3 278.3	270.7 156.1	7 7	26.6 65.6
	4"	8	2956 8130	193.4 278.5	452.2 155.9	7 7	34.8 74.0
	4 1/2"	8	3767 10360	218.9 315.2	169.7 173.8	8 8	49.8 105.7
M120		6.0	3976 10930	232.8 335.2	176.5 180.3	8 8	44.5 109.7
	5"	4	4453 12250	244.4 352.0	180.5 185.1	8 8	66.0 140.4
	6"	4	6518 17930	295.6 425.7	202.0 207.6	8 8	108.1 230.3

\*Maximum operating temperature : 630deg.C with the patented metal seals  
 \*Maximum force : Rated at 300Mpa and to be proportionally adjusted by an actual operating pressure  
 \*Material : subject to an operating hydraulic pressure and temperature for each application  
 \*Any other size not shown in this table : To be designed and manufactured to the given application  
 \*Pretension vs Residual load ratio : To be supplied upon request when application specification is submitted  
 \*Small bolt under 1" : To be recommended to use our 21Nut with force multiplier + impact wrench for a quick and accurate operation



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