



Hong-ji LOCK

When Safety Counts



Multi-Material
Solutions



Axial-Mechanism

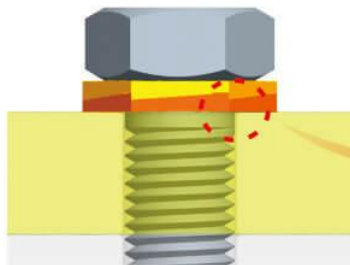


NAS-3350
Shock Vibration
Test Approved

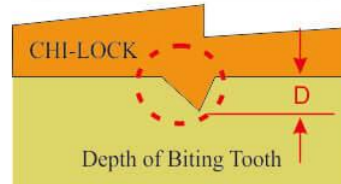


Principle I

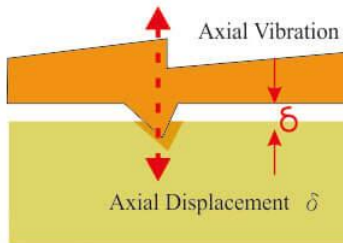
Biting Teeth >>>> Resisting Axial and Transverse Vibration



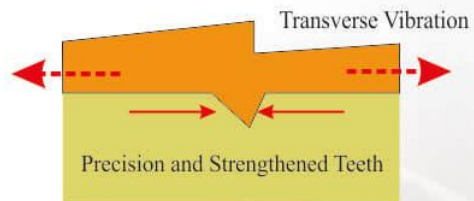
The geometric profile of biting tooth provides good shear resistance in specific direction



◆ The precision biting teeth dig into the joint surfaces and keep the fastener away from detachment.



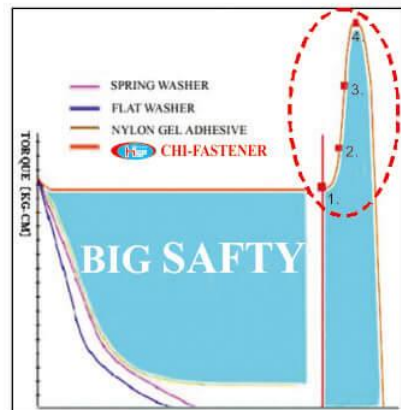
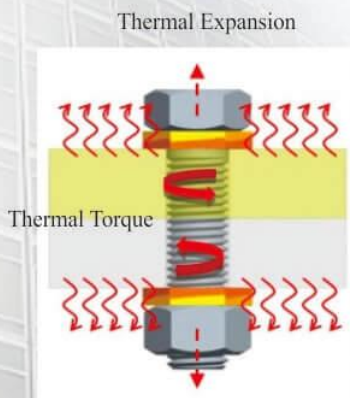
◆ If $D > \delta$, the washer will keep attachment, and the depth of biting teeth will absorb the axial displacement.



◆ The biting teeth resist the transverse vibration and anchor the washer in place.

Principle II

Wedge Effect >>>> Absorbing Thermal Expansion and Resisting Untightening Torque



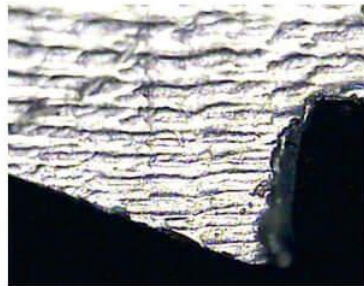
- ◆ When the operating temperature raise or the bolt is untightened with dynamic loads, the upper washer climbs along the ramp (Point 1→2→3) and the bolt keeps its contact stress.
- ◆ The bottom washer won't rotate from its anchored location.
- ◆ The wedge effect will actually increase in the climbing process to resist the untightening torque and absorb the thermal expansion.

CHARACTERISTIC

www.hsp139.com.tw/

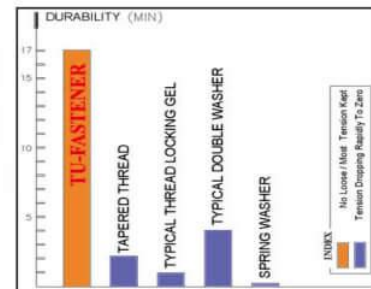
Precise-Engineering

- Create Phenomenal Stress to Make Efficient Bite



Multi-Functions

- To Resist Three Dimensional Shock Vibration (NAS-3350 TEST APPROVED)
- The Wedge Effect Absorb Thermal Differential and Make Up Tensile Force Efficiently
- Various Metal Selections to Resist Corrosive Environment.
- To Sustain Huge Pressure Variation of Petro-Chemistry Vessel.
- Distinguished Friction Resistance.



Handy Operation

- Compatible with Standard Tools. No Special Socket Required.
- No Tack- Welding Required.
- No Hammerwrench Required.
- Compatible with Hydraulic Bolt-Tensioner Operation
- Compatible with Torque Control Bolt Operation.

Total Solution of Supplying A Variety of Metal

- Titanium Alloy: for Extremely Corrosive or Extreme Temperature Interface
- Duplex Stainless Steel: Much Better Chloride Resistance and Strength than SS316/304
- Carbon Steel : For General Application of Vibration
- Spring Steel : For Thermal Interface up to 300°C
- Hot Work Tool Steel : For Thermal Interface up to 530°C
- High Hardness Tool Steel : To Overcome Wear Resistance Steel with Extreme Hardness

Direct Sale w/ Professional Service

- Provide Professional Service and Total Solution for Clients.
- Provide Custom-Made Service .
- Direct Sale with Genuine Service .

Optimized Benefit

- Consulting For A Variety of Equipments in Terms of Vibration/Thermal Variation/Corrosion
- Phenomenantly Reduce Job Site Accidents Arisen from Loose Joints
- Cost Down the Equipment Management Expense Dramatically
- Please Refer to CHI-LOCK Projects in Each Relevant Type of Equipments.



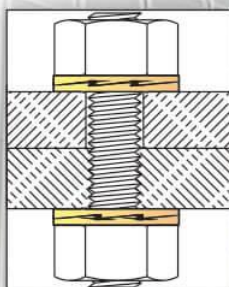
Select Material

	Action To Do	Demonstration A.	Demonstration B.	Demonstration C.
Step1	Confirm Hardness of the Substrate Metal	Most mid-carbon substrate metal w/Hardness<20HRC	Austenitic Stainless is usually close to 0 HRC	If any special treatment on mating surface, please confirm its hardness.
Step2	Relative Hardness > 10HRC	To ensure that the tiny teeth of washer can exert their biting function	To gain efficient bite, the washer's metal should be of high hardness and high strength	Biting Depth is prerequisite for resisting axial differential arisen from vibration or temp. Variation
Step3	Confirm Working Temperature	Titanium Alloy is good for -200~600°C	Duplex Stainless Steel is good for -40 ~300°C	Carbon Steel is good for 0~150°C Spring Steel is good for 0~300°C Hot Work Tool Steel is good for -90~530°C
Step4	Confirm Corrosion Condition	Avoid using Austenitic Stainless for Chloride Environment.	Please also refer to Iso-Corrosion Comparison Chart .	CHI-LOCK welcome your further inquiry.

Multi- Material vs. Interface Types

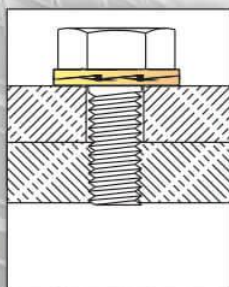
CHI-LOCK MATERIAL	Titanium Alloy	Duplex Stainless Steel	Carbon Steel	Spring Steel	Hot Work Tool Steel	High Hardness Tool Steel	
Washer Hardness (HRC)	32~36	26max	46~50	46~50	46~50	62~63	
APPLICATION	Extreme Corrosion	Etching, Chemistry, Clean Room	Food & Drug, Clean Room, Packing				
	Chloride Environment	Petrochemistry, Underwater Egnr.	Offshore , Harbor,				
	Working Temperature	-200~ 600 °C	-40~300 °C	0~150 °C	0~300 °C	-90~530 °C	0~530 °C
	Thermal Variation	Boiler, Heat Exchanger	Condensor , Heat Exchanger	Heat Exchanger, Turbine, Boiler			
	Vibration	Air Plane, Curtain-wall, Evaporation Tower , Boat, Subsea Egnr.	Pipeline, Compellor, Boat,	Pipeline, Gear Box, Bearing Locator, Railway, Flare Tower, Vehical, Muffler, Compressor , Rotatery Machine, Pump, Coupling , Mixer, Caterpillar Tractor		Scraper Reclaimer, Mining Facility, Sieving Machine	
	Special Safety	Nuke Plant Piping	To Replace Austenitic Satainless 316/ 304	Coupling, Railway, Civil Engr., Slew Bearing , Crusher , Overhead Traveling Crane		Coal Conveying System, Mining Pulverizer	

Assembly Examples



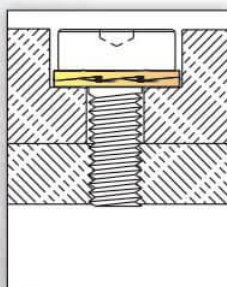
Stud Bolt+2 Nuts + 4 Washers

▶ CHI-LOCK washers for through hole



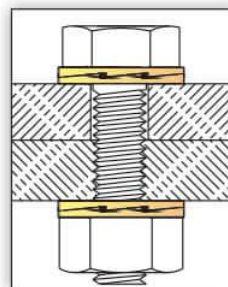
Hex Head Bolt + 2 Washers

▶ CHI-LOCK washers for tapped hole



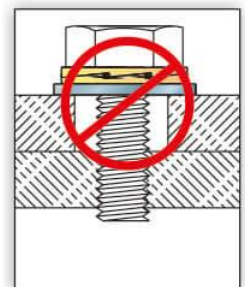
Socket Cap Screw + 2 Washers

▶ CHI-LOCK washers for counter-bored hole



Hex Head Bolt + Nut + 4 Washers

▶ CHI-LOCK washers for through hole



TABOO

▶ Don't use other type of washer with CHI-LOCK

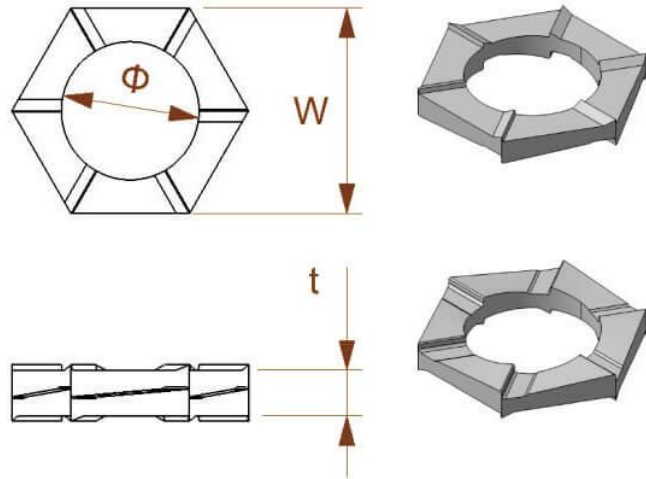
PRODUCT CODE & DIMENSIONS

www.hsp139.com.tw/

Anti-loose washer

Suitable equipment occasion

-200~600°C



MATERIAL : Titanium Alloy No.1

Washer Hardness : HRB80°

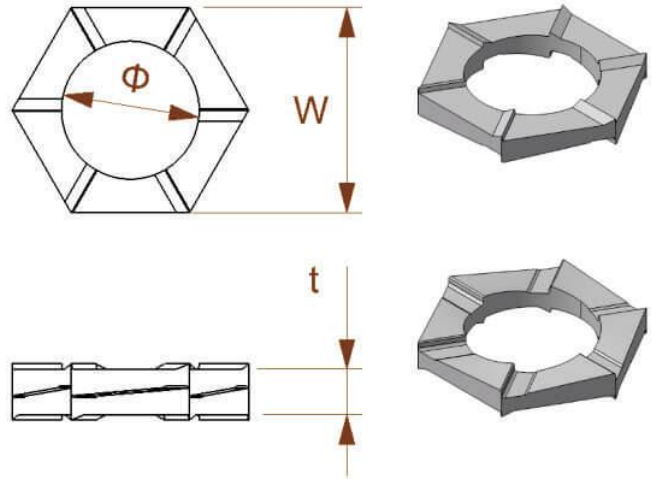
CHI-LOCK Product Code	Bolt Size		Heavy Bolt Size		CHI-LOCK Washer Dimensions (mm)			
	Metric	UNC	Metric	UNC	W (±0.3)	φ (±0.3)	t (±0.8)	
CHI-2W-006	M6				10.4	7.0	3.4	
CHI-2W-007		1/4"			11.5	7.8	3.4	
CHI-2W-008	M8	5/16"		1/4"	13.4	9.0	3.4	
CHI-2W-010	M10	3/8"		5/16"	17.4	11.0	4.0	
CHI-2W-012	M12	7/16"		3/8"	19.4	13.0	4.0	
CHI-2W-013		1/2"		7/16"	19.5	14.3	4.9	
CHI-2W-014	M14	9/16"	M12	1/2"	22.4	15.1	4.9	
CHI-2W-016	M16	5/8"	M14	9/16"	24.4	17.1	4.9	
CHI-2W-018	M18		M16	5/8"	27.4	19.1	4.9	
CHI-2W-020	M20	3/4"			30.4	21.1	6.5	
CHI-2W-022	M22	7/8"	M20	3/4"	34.4	24.1	6.5	
CHI-2W-024	M24		M22	7/8"	36.4	25.2	6.5	
CHI-2W-025		1"			38.5	27.6	7.4	
CHI-2W-027	M27		M24	1"	41.4	28.3	9.8	
CHI-2W-030	M30	1-1/8"	M27	1-1/8"	46.4	31.3	9.8	
CHI-2W-033	M33	1-1/4"	M30	1-1/4"	50.4	35.0	9.8	
CHI-2W-036	M36	1-3/8"		1-3/8"	55.4	37.3	10.6	
CHI-2W-039	M39	1-1/2"	M36	1-1/2"	60.4	40.6	10.6	
CHI-2W-042	M42				65.4	43.6	11.4	
CHI-2W-045	M45	1-3/4"	M42	1-3/4"	70.4	46.9	14.2	
CHI-2W-048	M48				75.4	49.7	14.2	
CHI-2W-052	M52	2"	M48	2"	80.4	53.4	14.2	

Note: Welcome your inquiry for other sizes that weren't listed in the standard product table above.

Anti-loose washer

Suitable equipment occasion

0~300°C



MATERIAL : High Carbon SK5

Washer Hardness : HRC42°~45°

CHI-LOCK Product Code	Bolt Size		Heavy Bolt Size		CHI-LOCK Washer Dimensions (mm)			
	Metric	UNC	Metric	UNC	W (±0.3)	φ (±0.3)	t (±0.8)	
CHI-2W-006	M6				10.4	7.0	3.4	
CHI-2W-007		1/4"			11.5	7.8	3.4	
CHI-2W-008	M8	5/16"		1/4"	13.4	9.0	3.4	
CHI-2W-010	M10	3/8"		5/16"	17.4	11.0	4.0	
CHI-2W-012	M12	7/16"		3/8"	19.4	13.0	4.0	
CHI-2W-013		1/2"		7/16"	19.5	14.3	4.9	
CHI-2W-014	M14	9/16"	M12	1/2"	22.4	15.1	4.9	
CHI-2W-016	M16	5/8"	M14	9/16"	24.4	17.1	4.9	
CHI-2W-018	M18		M16	5/8"	27.4	19.1	4.9	
CHI-2W-020	M20	3/4"			30.4	21.1	6.5	
CHI-2W-022	M22	7/8"	M20	3/4"	34.4	24.1	6.5	
CHI-2W-024	M24		M22	7/8"	36.4	25.2	6.5	
CHI-2W-025		1"			38.5	27.6	7.4	
CHI-2W-027	M27		M24	1"	41.4	28.3	9.8	
CHI-2W-030	M30	1-1/8"	M27	1-1/8"	46.4	31.3	9.8	
CHI-2W-033	M33	1-1/4"	M30	1-1/4"	50.4	35.0	9.8	
CHI-2W-036	M36	1-3/8"		1-3/8"	55.4	37.3	10.6	
CHI-2W-039	M39	1-1/2"	M36	1-1/2"	60.4	40.6	10.6	
CHI-2W-042	M42				65.4	43.6	11.4	
CHI-2W-045	M45	1-3/4"	M42	1-3/4"	70.4	46.9	14.2	
CHI-2W-048	M48				75.4	49.7	14.2	
CHI-2W-052	M52	2"	M48	2"	80.4	53.4	14.2	

Note: Welcome your inquiry for other sizes that weren't listed in the standard product table above.

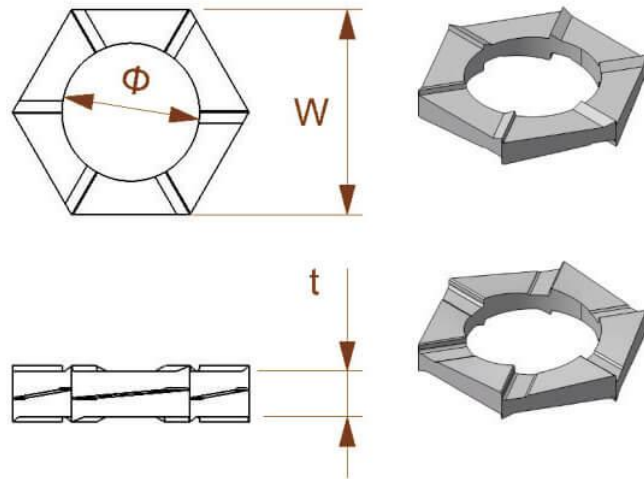
PRODUCT CODE & DIMENSIONS

www.hsp139.com.tw/

Anti-loose washer

Suitable equipment occasion

0~530°C



MATERIAL : Stainless Steel 316#

Washer Hardness : HV95°~100°

CHI-LOCK Product Code	Bolt Size		Heavy Bolt Size		CHI-LOCK Washer Dimensions (mm)			
	Metric	UNC	Metric	UNC	W (±0.3)	φ (±0.3)	t (±0.8)	
CHI-2W-006	M6				10.4	7.0	3.4	
CHI-2W-007		1/4"			11.5	7.8	3.4	
CHI-2W-008	M8	5/16"		1/4"	13.4	9.0	3.4	
CHI-2W-010	M10	3/8"		5/16"	17.4	11.0	4.0	
CHI-2W-012	M12	7/16"		3/8"	19.4	13.0	4.0	
CHI-2W-013		1/2"		7/16"	19.5	14.3	4.9	
CHI-2W-014	M14	9/16"	M12	1/2"	22.4	15.1	4.9	
CHI-2W-016	M16	5/8"	M14	9/16"	24.4	17.1	4.9	
CHI-2W-018	M18		M16	5/8"	27.4	19.1	4.9	
CHI-2W-020	M20	3/4"			30.4	21.1	6.5	
CHI-2W-022	M22	7/8"	M20	3/4"	34.4	24.1	6.5	
CHI-2W-024	M24		M22	7/8"	36.4	25.2	6.5	
CHI-2W-025		1"			38.5	27.6	7.4	
CHI-2W-027	M27		M24	1"	41.4	28.3	9.8	
CHI-2W-030	M30	1-1/8"	M27	1-1/8"	46.4	31.3	9.8	
CHI-2W-033	M33	1-1/4"	M30	1-1/4"	50.4	35.0	9.8	
CHI-2W-036	M36	1-3/8"		1-3/8"	55.4	37.3	10.6	
CHI-2W-039	M39	1-1/2"	M36	1-1/2"	60.4	40.6	10.6	
CHI-2W-042	M42				65.4	43.6	11.4	
CHI-2W-045	M45	1-3/4"	M42	1-3/4"	70.4	46.9	14.2	
CHI-2W-048	M48				75.4	49.7	14.2	
CHI-2W-052	M52	2"	M48	2"	80.4	53.4	14.2	

Note: Welcome your inquiry for other sizes that weren't listed in the standard product table above.



Hong-Ji Precision Industry Co., Ltd.

No.52, Anlin 4th St., Yanchao Dist., Kaohsiung City 82443, Taiwan.

TEL : 886-7-616-9878

E-mail : hsp139@ms33.hinet.net

FAX : 886-7-616-6967

[http : //www.hsp139.com.tw/](http://www.hsp139.com.tw/)

