Innovative

Self-Locking Screw

The Self-Locking Screw Specialists

MIZOBE BOLT

Patented

Japan:2724099

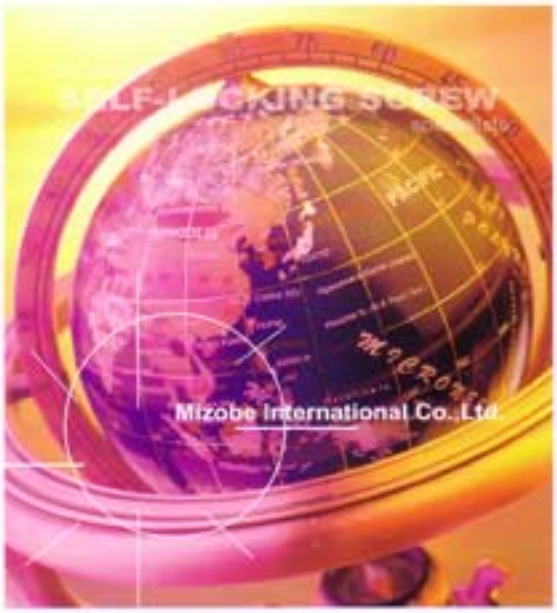
USA:VS6514025B2

China:117894

- Self-Locking Action
- World-wide Patent
- Correspond to NAS Standard

Mizobe bolt

Mizobe International Co. Ltd, a Hong Kong company, is focusing on expansion into the world market through "Mizobe Bolts", a screw and bolt system with a self-locking action.



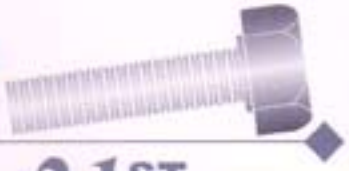
Introduction

Bolts and screws are generally used as fastening systems for assembly, the connection of mechanical parts, and in the building industry. It is seldom that the long-term performance of the fastening method is considered and, as a result, standard screws and bolts work loose when subjected to vibration. Companies or individuals are then responsible for the considerably high financial cost of parts replacement and potential lawsuits as a result of safety issues. This is of major concern to companies. As a result, many applications require a bolt or screw system that can ensure a high quality connection with a self-locking action.

"Mizobe Bolts" was developed and granted a patent to meet these user requirements.

The "Mizobe Bolts" system utilizes slit, which runs down the centre of the thread causing the bolt or screw to lock, once wound in place. This results in a fastening system, which is safe, easy to handle, vibration/noise free, and entails considerably lower maintenance charges during and after installation.

MIZOBE BOLT



THE FASTENER INNOVATION FOR THE 21ST CENTURY

Stay-tight and environmentally friendly screws and bolts

SELF-LOCKING SCREW

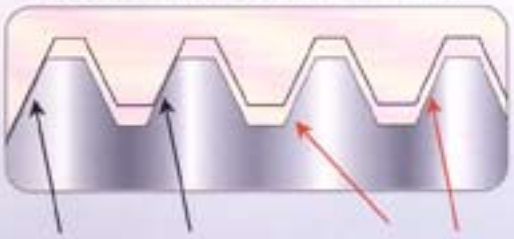
Cross-sectional view of Mizobe Bolt and nut contact area

The slit, which runs down the centre of the thread, facilitates "Mizobe Bolts" innovative self-locking action. "Mizobe Bolts" are able to maintain a tight contact with nuts or taps even after repeated use.

Locking Mechanism:

General bolt vs. MIZOBE BOLT when installed with nut(conceptual picture)

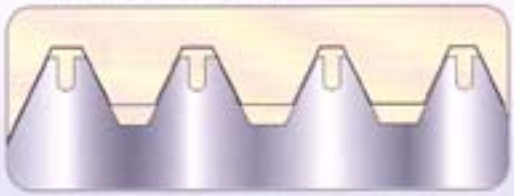
(general locking bolt joined with nut)



concentration of load only on 1st or 2nd forward flank

no stress load

(**MIZOBE BOLT** joined with nut)



Stress load is evenly distributed along each and every flank throughout the entire length of the threaded bolt. This greatly enhances the strength of the connection.

When general bolts and screws are tightened, the contact points are restricted to the first and/or second forward flank(s) of the thread. This concentrates the load on these limited points lessening the contact throughout the bolt. With **MIZOBE BOLTS** the first five flanks of the bolt are in contact with each and every flank of the nut. The load is evenly distributed over the entire length of the nut and bolt resulting in high torsional forces that prevent the two components from separating due to vibration. Furthermore, the need for excessive force when tightening the nut is reduced.

Locking Mechanism:

General bolt vs. **MIZOBE BOLT** when installed with nut (real picture)

general bolt

MIZOBE BOLT

Inherent Locking Function

As the bolt is rotated forward, the flanks of the nut squeeze the lower portion of the bolt. This results in the widening of the slit at the top of the thread causing its outer edges to firmly contact the lower portion of the nut.

Repetitive Use

Unique to **MIZOBE BOLTS**, the flexible flank pivots on its centre and the range of movement is kept within the elasticity of the material used. This enables the slit to return to its original position upon removal of the nut. As a result **Mizobe Bolts** can be used over and over again with only nominal wear.

Superb Efficient Performance

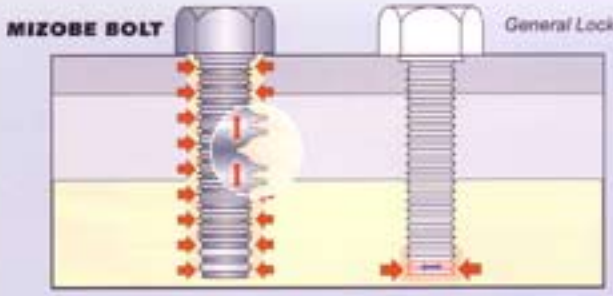
Generally, locking bolts require additional washers or the application of adhesive material. Whereas, **MIZOBE BOLTS** are fabricated from a single material via standard bolt manufacturing equipment.

MIZOBE BOLT

General Locking Screw

Increased Relative Strength

Torsional stress in general locking screws is concentrated on the first and or second forward flanks. While stresses in **MIZOBE BOLTS** are evenly distributed throughout all the flanks creating a relative strength increase of between 20 to 50%.



Outstanding Labour Efficiency

No pre-setting, contact surface preparation or application of adhesives or washers are required.

Suitable for Screw Parts of various shape and material

The **MIZOBE BOLT** system is suitable for use in a diverse range of bolt shapes and materials. This is one of many advantages of **MIZOBE BOLTS** that other types of locking bolt do not have. This increases the scope of design and enables cost reductions for your company.

MIZOBE BOLT's Standard Prevailing Torque

The only self-locking bolt system in the world that exhibits inherent locking strength and eliminates the instability that is common with conventional contact-friction or locking bolts.

TIGHTENING LOAD

UNIT : N · m

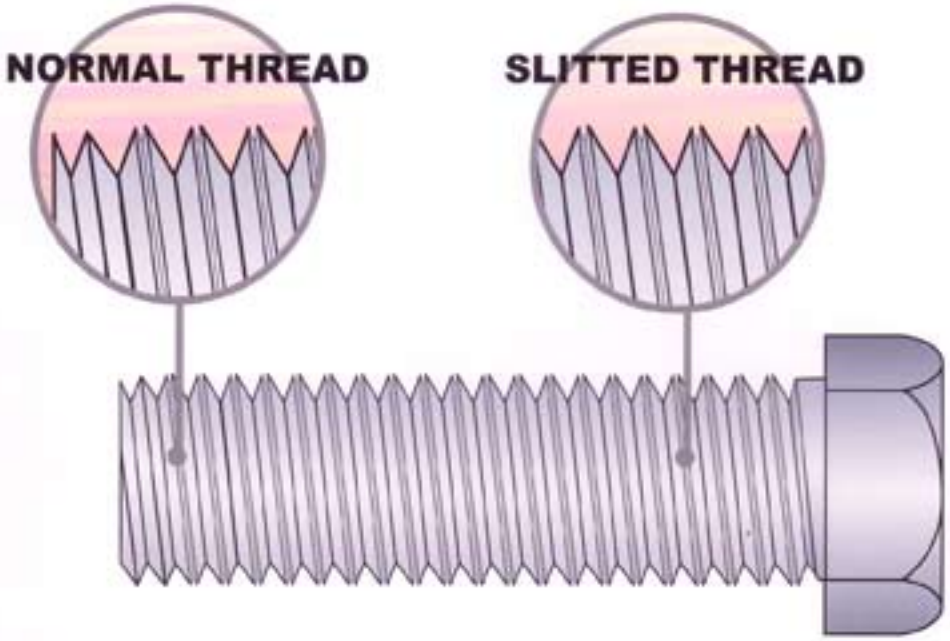
Nut Spec	Strength 4.8	Strength 8.8	Strength 12.9
M2	0.17	0.29	0.39
M2.5	0.34	0.63	0.84
M3	0.65	1.17	1.62
M4	1.70	3.00	3.23
M5	3.20	5.83	7.77
M6	5.40	9.70	12.95
M8	12.90	23.73	31.28
M10	25.90	46.39	62.57
M12	45.30	81.98	107.88
M14	74.50	133.76	178.00
M16	116.50	215.70	280.50
M18	161.80	291.28	388.30
M20	226.50	409.97	550.10
M24	366.70	658.02	884.50

PREVAILING TORQUE

UNIT : N · m

Screw Spec	install(max)	first detach (min)	fifth detach (min)
M1.4	0.1	0.01	0.003
M2.5	0.35	0.08	0.03
M3	0.43	0.12	0.08
M4	0.90	0.18	0.12
M5	1.60	0.29	0.20
M6	3.00	0.45	0.30
M8	6.00	0.85	0.60
M10	10.50	1.50	1.00
M12	15.50	2.30	1.60
M14	24.00	3.30	2.30
M16	32.00	4.50	3.00
M18	42.00	6.00	4.20
M20	54.00	7.50	5.30
M24	80.00	11.50	8.00

Easy screw-in with combined threads



MIZOBE BOLT

Corresponds to International Environmental Regulations - Pollution Control

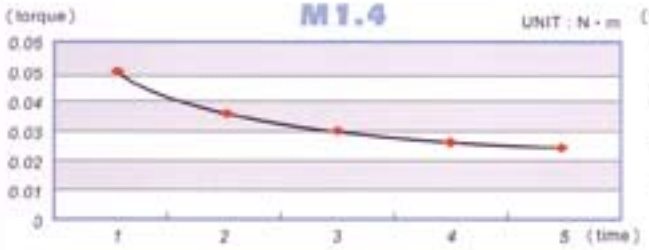
To comply with international environmental principles, MIZOBE BOLT recognises its ecological responsibilities as a member of the global environment. We strictly adhere to the requirements of international environmental protection standards when selecting product and packaging materials as well as the recovery, reuse and proper disposal of waste. We are firm believers that our environmental policies, though small in the global scale, contribute to reducing the ecological footprint our industry makes.

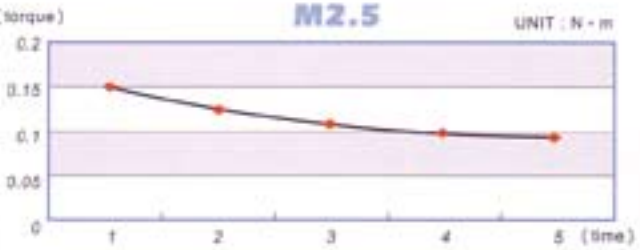
Oversea's Patent Pending

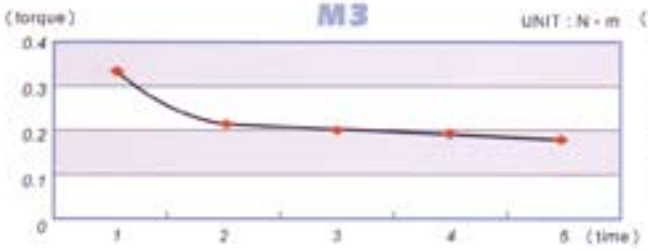
Taiwan: #90110697
Europe: #011131109
Korea: #2001-30002

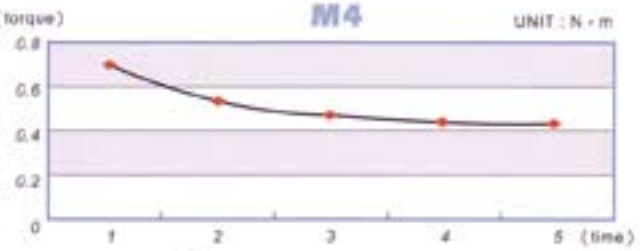
(5 times repeated use)

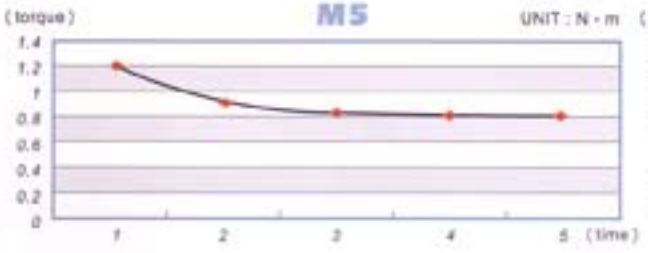
MIZOBE BOLT - Prevailing Torque Curves

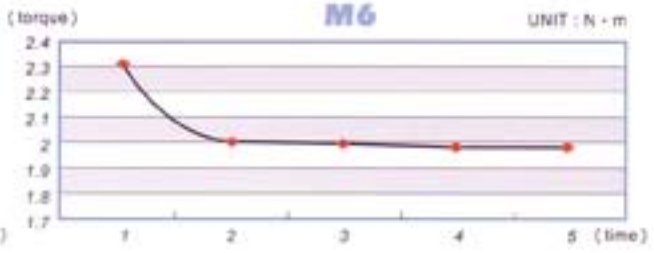


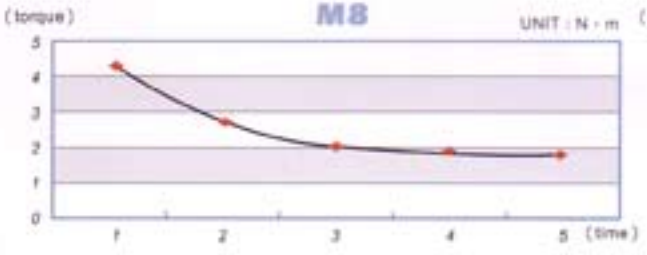


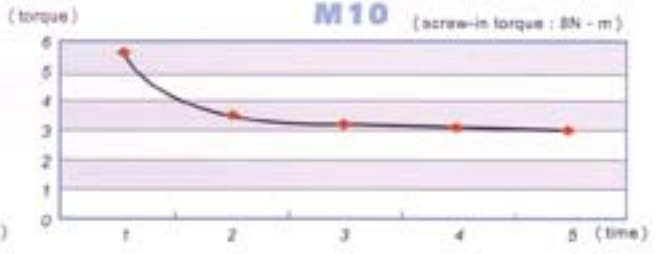


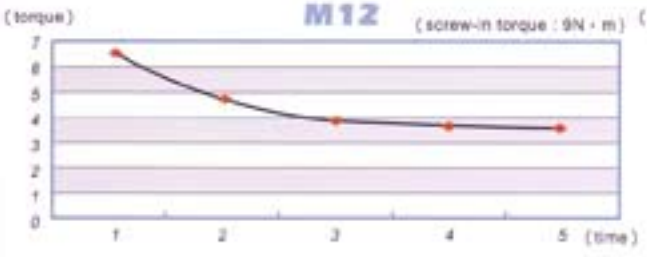


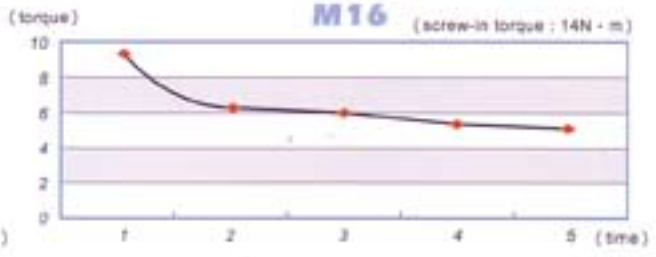


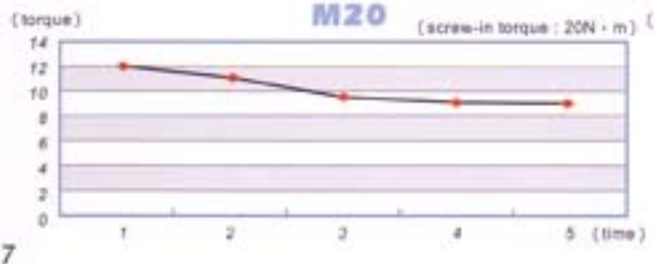


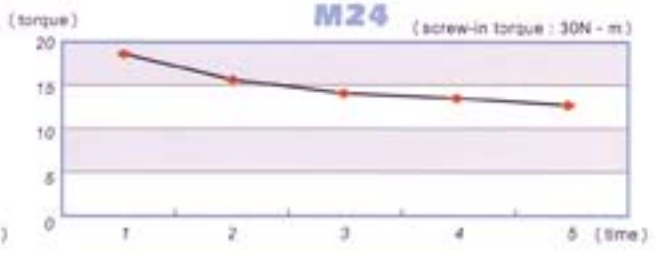








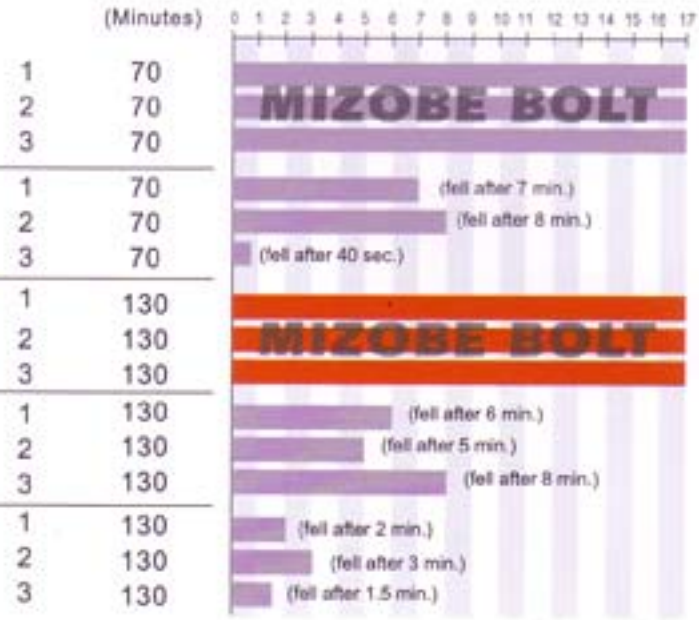




Vibration Test - MIZOBE BOLT vs other screws

MIZOBE BOLT has been granted patents in Japan, U.S.A., China and other countries. A unique manufacturing design enables a secure self-locking action. Rigorous vibration testing indicated that **MIZOBE BOLT**s possess excellent self-locking characteristics.

items tested	number	torque (Minutes)	test results	unit
MIZOBE BOLT SUS304 M12X60 Hexagon Bolt + Hexagon Nut	1	70	MIZOBE BOLT	37.8
	2	70		38.5
	3	70		39.1
Nylon Patch # 1 SUS304 M12X60 Hexagon Bolt + Hexagon Nut	1	70	(fell after 7 min.)	-
	2	70	(fell after 8 min.)	-
	3	70	(fell after 40 sec.)	-
MIZOBE BOLT SCM435 M12X60 InnerHexagon Bolt + Hexagon Nut	1	130	MIZOBE BOLT	71.2
	2	130		71.5
	3	130		72.2
Nylon Patch # 1 SCM435 M12X60 InnerHexagon Bolt + Hexagon Nut	1	130	(fell after 6 min.)	-
	2	130	(fell after 5 min.)	-
	3	130	(fell after 8 min.)	-
Nylon Patch # 2 SCM435 M12X60 InnerHexagon Bolt + Hexagon Nut	1	130	(fell after 2 min.)	-
	2	130	(fell after 3 min.)	-
	3	130	(fell after 1.5 min.)	-



MIZOBE BOLT Self-Locking Bolt - Vibration Test

Test Method: Samples were analysed on a vibration machine. Samples that had not separated after 17 mins were subjected to a return rotation test.

Test Machine: High vibration frequency bolt separator machine

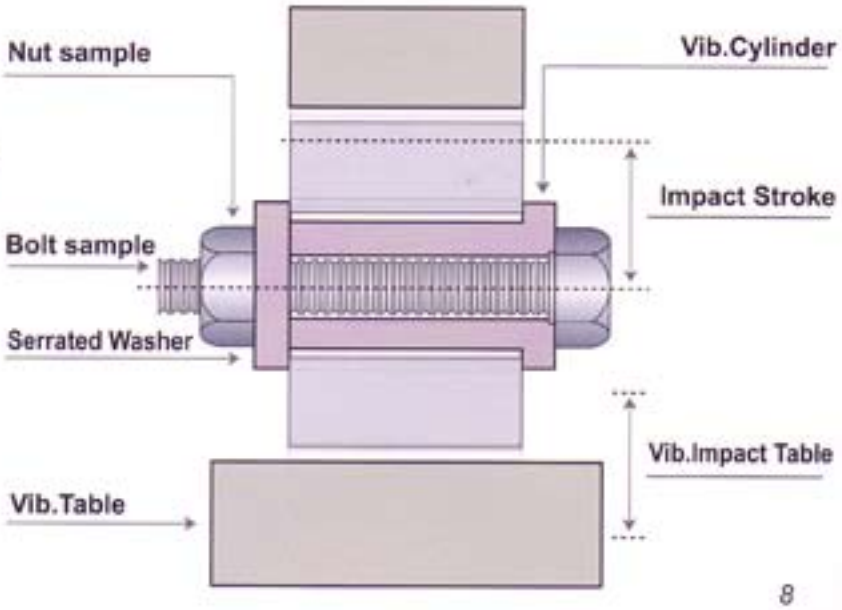
Test Conditions:

Vibration speed: 1780rpm

Vibration Impact Table Thickness: 11mm

Vibration Amplitude: 19mm

Vibration Direction: Perpendicular to bolt axis



INDUSTRIES

Large Diameter Products

Railway, Heavy Machinery, Ship, Construction Machinery, Bridge, Nuclear Power Plant, Heavy Duty Vehicle, etc.

Medium Diameter Products

Automobile, Construction, Food Processing, Machining Center, Printing Machinery, Industrial Machinery, etc.

Small Diameter Products

Electric Appliances, Electronics, Precise Machinery, Housing, Medical, Spectacles, Watches, etc.

MIZOBE BOLT

The Screw and Bolt Revolution of the 21st Century - Created by MIZOBE BOLT

MIZOBE BOLT

Characteristics of Mizobe Bolt

1. Maintain a strong connection via its self-locking mechanism.
2. Enhanced safety and decreased noise because of reduced vibration.
3. Maintenance intervals are extended because of loose preventive mechanism.
4. Torsional stress is evenly distributed throughout the engaged portion of the bolt resulting in a relative strength increase of 20-50%.
5. Taps, internal bolts and special tools are not required.
6. Economical to purchase and use compared to general locking systems because other components, such as spring washers, double nuts, wire lashings, adhesive treatments or solvents are not necessary.
7. Connection quality is not compromised after repeated use.

The world's

SELF-LOCKING SCREW

specialists

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