

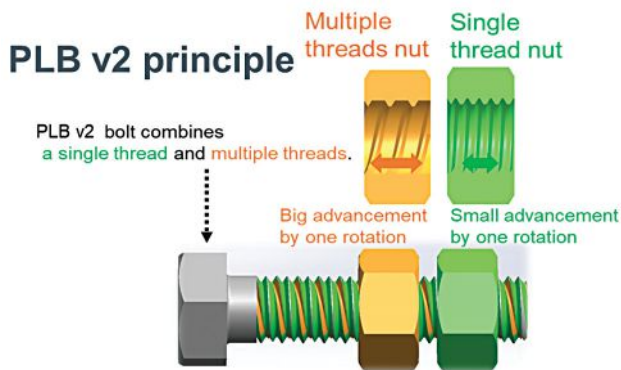
Anti-Loosening Double Nut Bolt

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An invitation to look at a new solution to the old bolt loosening problem and to not rely on the “friction”, but on the “Mechanical Locking System”.

What is the PLB v2?

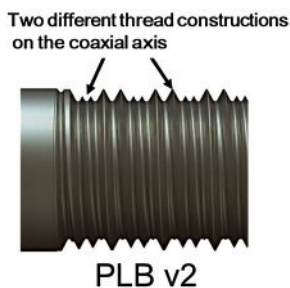
The PLB v2 has been designed to address the issues associated with the self-loosening of a bolted joint. By design, the PLB v2 consists of a dual-thread screw shaft and two nuts of different thread pitches. The first, or big lead nut on the shaft, is a multiplies-thread nut. The outer or secondary nut on the shaft is a single-thread nut.



As for double nuts assembly, vibration initiates loosening with the inner nut. With PLB v2, the inner nut's advance is blocked by the slower-moving outer nut.

The mechanical lock is the secret to the PLB v2 Anti-loosening design. No other fastener system in the world can make this offer. Most other anti-loosening kits use “friction” for their anti-loosening function despite its uncertainty. However, PLB v2 has a reliable solution.

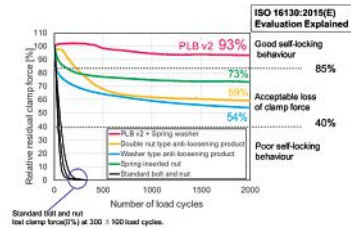
PLB v2 locks the nuts with a “MECHANICAL LOCKING SYSTEM” that prevents them from loosening.



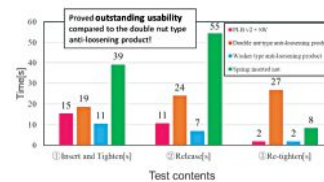
Main Features of the PLB v2

High Locking Performance. The vibration loosening tests are conducted using a Junker test bench (J121, Vibrationmaster) in accordance with *ISO16130*. The relative residual clamp forces of all PLB v2 remain almost constant during the vibration test. The final rate of any residual clamp force exceeded the reference value of 85% given in the

ISO16130 standard. Our lab tests have proven PLB v2’s outstanding self-locking features over 85% of remaining clamp force that no other anti-loosening product offers.



Exceptional Usability. PLB v2 can be tightened with one action, whereas a standard double-nut type bolted joint requires two to three steps for tightening. No special tool is required. With the PLB v2, all you have to do is tighten the outer nut. The inner nut follows the outer nut and is tightened along with the outer unit.



The test was conducted per the following contents in accordance with the official recommended working methods.

1. Insert and Tighten: Measure the time when the nut is tightened with the specified torque.
2. Release: Measure the time to remove the tightened nut from the bolt.
3. Re-tighten: Measure the time when the nut is re-tightened with the specified torque or more.

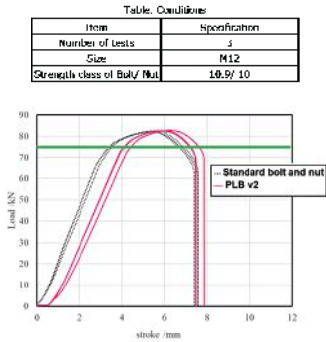
Most anti-loosening kits are difficult to work with because they cannot be tightened/released with power or standard tools.

The PLB v2 can tighten/release with a power and standards tool, proving outstanding usability compared to the same double nut type anti-loosening product.

Proved high tensile strength. We conducted the tensile strength tests, which is an important mechanical property of bolted joints. There are many products with ingenious screw shapes, but few of them publish their tensile strength performance. The tensile strength tests of M12 PLB v2 and standard bolt and nut were conducted using the Autograph AG-25TB, from **Shimadzu Corporation**. All these tests were conducted three times under the same conditions; the same results were obtained in each trial. The red line shows the

PLB v2, the black dashed line shows the standard bolt and nut, green horizontal line shows the yield point converted to load (kN). PLB v2 offers a tensile strength higher than the yield point in all specimens as well as the standard bolt and nut.

It is shown that the user can utilize the PLB v2 without any practical problems.



High Reputation Received

Awards for technology innovations. The PLB v2 was awarded the Technology Development Award (small and medium-sized businesses) by JSTP in 2021. The title of the paper was “Development of the world’s first mass-produced affordable anti-loosening bolts using thread rolling process”, in which the high performance of the PLB v2 and the production of PLB v2 thread rolling dies for mass production were highly evaluated.

The PLB v2 is the optimum product of Anti-loosening kits with high technology.

Exhibited International Fastener Expo 2021

We, NISSEI CO., Ltd., exhibited PLB v2 at the *International Fastener EXPO 2021* in Las Vegas, NV, USA. We have received comments from various departments:

Manufacturers: Firstly, they have products like PLB v2 with the same materials and similar applications. This allows for these manufactures to grow their product offerings, without having to change their raw materials. Another reason they found PLB v2 attractive is the accessibility to this technology. Since NISSEI’s dies are made to fit in a standard threading machine, it takes less time to create PLB v2.

Distributors: They found the locking bolt system to be intriguing because the durability of the product in conjunction with the myriad of applications for it. The long-lasting locking bolt system is one that speaks for itself in the data. As soon as distributors understood PLB v2’s value, they began imagining their customer who would be able to find this indispensable.

Industry expert: Those who have been in the industry for a while were very intrigued by the Junker Test Graph that was on the catalogue. The visual was an effective comparison between PLB v2 and its competitors who have large market share creating quite the impact.

Most visitors said they had never seen a mechanism such as the dual threaded system. By touching the PLB v2, they felt and understood its outstanding performance. With this background, we decided to provide the PLB v2 samples to the user. And currently, we also look for the user to test the PLB v2 in the practical area that needs maintenance frequently. The user, who will test the PLB v2, can be provided the PLB v2 from us for free-of-charge, up to 10 pieces. If you have interested in it, please get in touch with us. For further discussion, contact the author at NISSEI in Japan at plb_bolt@nisseiweb.co.jp or visit www.nisseiweb.co.jp.

