



BOPA-LOCK™





BOPA-LOCK™

BOPA-LOCK Washers

In many industries, **BOPA-LOCK** has proven to be very effective against bolt loosening in tunneling, mining and drilling equipment. **BOPA-LOCK** is a reliable securing component, commonly used in applications generally exposed to severe vibration and dynamic loads, such as hydraulic hammers, crusher units, screens, feeders, raise borers, drill rigs, underground loaders, pumps, compressors, tracks, conveyors, motor vehicle engines etc.

We offer a superior bolt securing system that provides safe locking for bolted joints even when exposed to severe vibration and dynamic loads.
We help you optimize your bolted joints in order to minimize overall cost and maximize safety.



Products

The **BOPA-LOCK** securing system uses geometry to safely lock bolted joints in the most critical applications.

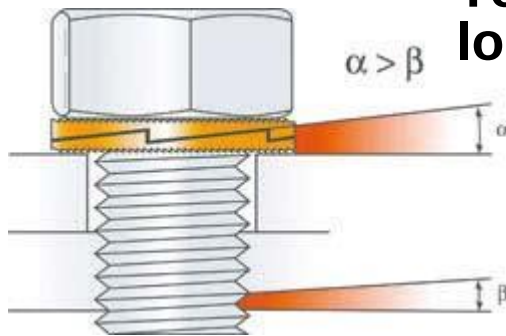
This unique wedge-locking system offers the following advantages:

- Maximum safety
- Resists loosening caused by vibration and dynamic loads
- Ease of assembly and disassembly
- Locking function is not affected by lubrication
- Positive locking at low and high preload levels
- Controllable preload
- Same temperature characteristics as standard bolt/nut
- Reusable





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Tension makes the bolt self-locking

The key is the difference in angles. Since the cam angle " α " is larger than the thread pitch " β ", the pair of washers expand more than the corresponding pitch of the thread. **BOPA-LOCK** washers positively lock the fastener in a joint which is subjected to extreme vibration or dynamic loads.

Steel washers





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Dimensions for steel washers

Detailed drawings available on request.



Torque Specifications

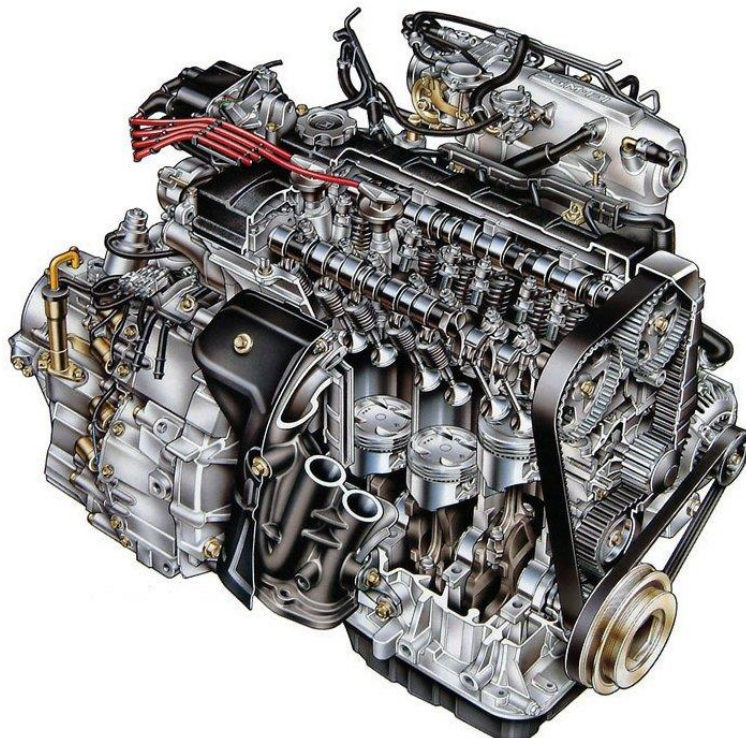
Available on request

*Material and dimensions are subject to change without prior notice.

Hardness

In order to assure the unique locking function of the **BOPA-LOCK** washers, the hardness of the mating surfaces should not exceed the hardness of the **BOPA-LOCK** washers (40 – 50 Rockwell).

The unique wedge-locking action of the **BOPA-LOCK** washers can be easily verified. Tighten the bolted joint with **BOPA-LOCK** washers, then loosen, during loosening, sliding must occur between the pair of **BOPA-LOCK** washers. Upon overriding of the cam faces a "click" should be felt when the bolt/nut comes loose. Upon inspection the surfaces should show clear impression marks made by the **BOPA-LOCK** washers. When all these criteria are fulfilled, **BOPA-LOCK** washers will always lock bolted joints exposed to severe vibration or dynamic loads.

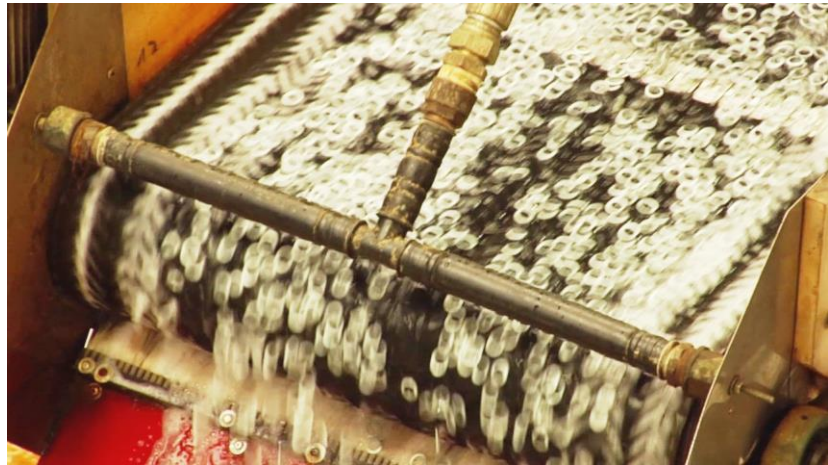




BOPA-LOCK™

BOPA-LOCK Mechanical Plating

Light Mechanical Plating



Material information

BOPA-LOCK washers are made of Cold Rolled Commercial Mild Steel or equivalent alloy. All **BOPA-LOCK** steel washers are Case Hardened. Stainless steel washers also available.

