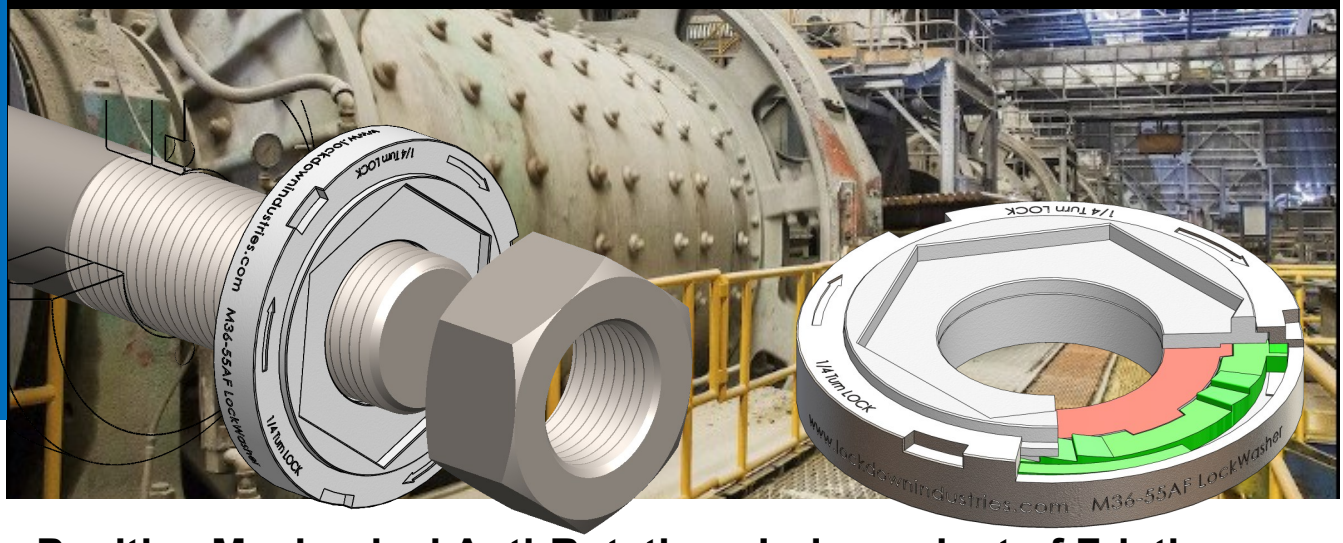
RATCHET LOW-FRICTION LOCKWASHER

Reusable mechanical locking and torque-efficiency system for standard nuts and bolts

PATENT PENDING



Positive Mechanical Anti-Rotation– Independent of Friction and Still Effective Even When Preload is Reduced

The Ratchet-LockWasher improves preload consistency while mechanically preventing unintentional reverse rotation.

1 Mechanical Lock

A positive ratchet prevents reverse rotation even if preload is reduced by relaxation, settlement or dynamic loading.

2 Low Friction Bearing Interface

Harden bearing surfaces and low friction coating reduce variability in bearing friction, improving torque-to-tension consistency and helping achieve a more consistent preload for a given tightening torque.

3 Reusable and Serviceable

Installs with standard nuts, bolts and tools. Tactile tightening feedback and intentional quick release support maintenance work.

4 LAS+ LockDown Active System

An active system with calibrated Belliville disc springs to add compliance and helps retain preload as settlement, wear and relaxation occur.

Two Separate Problems– Two Complementary Functions

Rotational lossening: addressed by the ratchet mechanical lock.

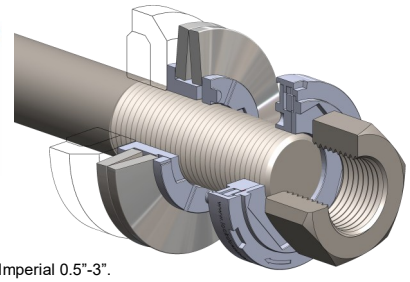
Preload loss: mitigated through improved preload accuracy and, where required, enhanced preload retention using the LAS+ LockDown Active System with calibrated disc springs.

Typical Applications



Mining liner bolts, motors and pumps, rail and structures, cranes, offshore equipment, wind, power generation, process equipment and other dynamic or hard-to-inspect bolted joints.

LAS+ LockDown ACTIVE SYSTEM



Sizes: Metric M12-M75, Imperial 0.5"-3".

LAS+ Benefits: *By incorporating a calibrated disc spring stack assembly, LAS+ provides:*

- ⇒ Active preload retention
- ⇒ Reduced preload loss
- ⇒ Increased joint compliance
- ⇒ Extended retorquing intervals
- ⇒ Reduced maintenance downtime
- ⇒ Positive mechanical locking retained

SCAN FOR WEBSITE

LAS+ LOCKDOWN ACTIVE SYSTEM — Illustrative Example– M36 x 4 x 300mm Bolt

Following 0.2 mm Joint Relaxation / Settlement

CONVENTIONAL JOINT	
Initial Clamp Load	508.4 kN
Remaining Clamp Load	399.5 kN
Preload Loss	**109 kN (21.4%)**

VS

LAS+ LIVE-LOADED JOINT	
Initial Clamp Load	504.9 kN
Remaining Clamp Load	488.6 kN
Preload Loss	**16 kN (3.2%)**

≈ 85%
REDUCTION IN PRELOAD LOSS

In this illustrative M36 example, calibrated disc springs add compliance to the fastening stack, dramatically reducing preload loss caused by joint relaxation and helping extend retorquing intervals.

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Application-specific evaluation recommended before field trial or production use.

LockDown INDUSTRIES Ltd