



THE
REACTION WASHER
COMPANY

FEATURES & BENEFITS

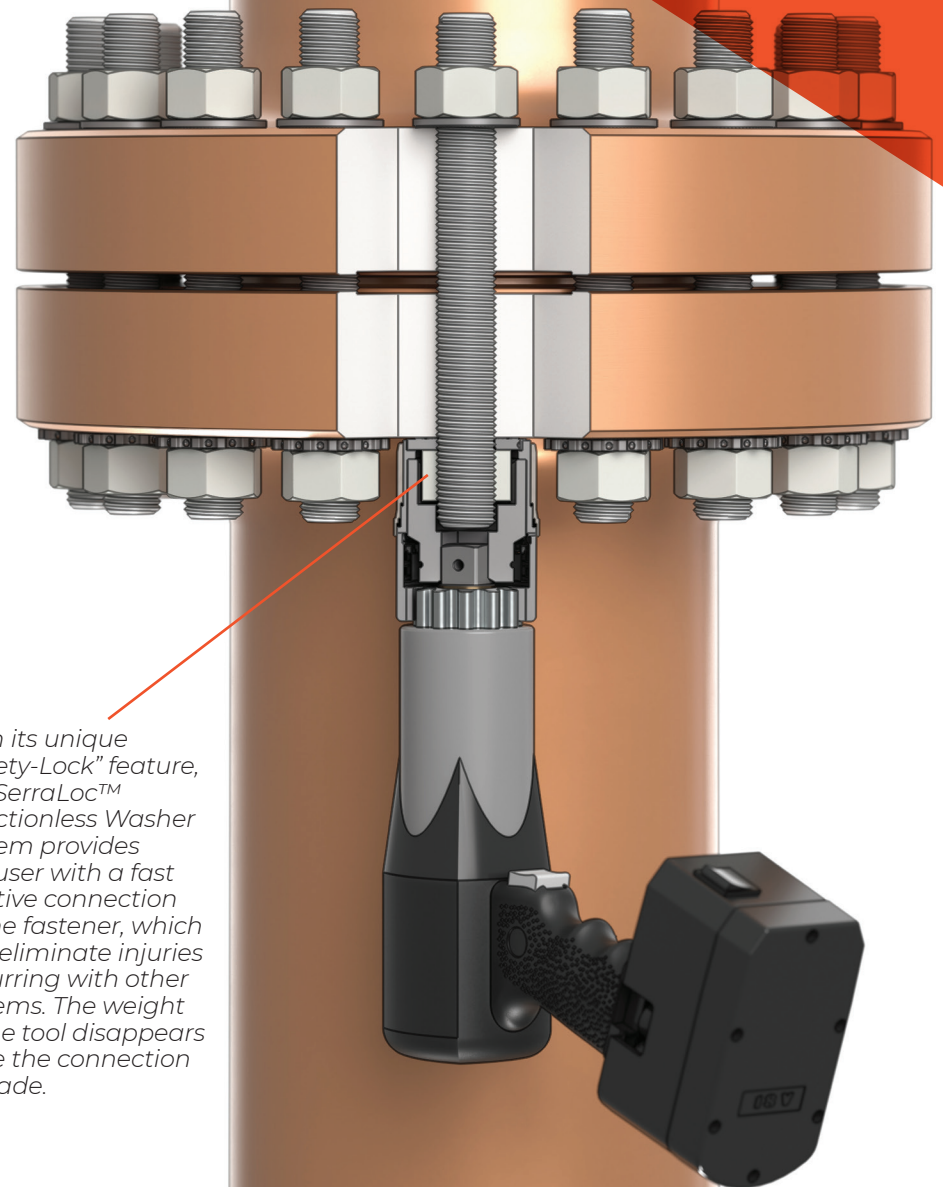
TURNING THE REACTIONLESS BOLTING WORLD UPSIDE DOWN

From its founding in 2015, The Reaction Washer Company has had one singular focus: to develop the safest, most reliable, repeatable and reusable Reaction Washer system in the global bolting market. The result...SerraLoc™.

Since its initial development in 2015, the evolution of the SerraLoc™ Reaction Washer System has achieved the ultimate design for reactionless bolting operation. With unparalleled user safety, reliability, speed, and precision, the technology has finally arrived to reinvent the process to achieve perfection in bolted assemblies. With over a dozen U.S. and International patents and/or patents pending, SerraLoc™, by The Reaction Washer Company, is the newest and most advanced system for reactionless torquing of threaded fasteners.

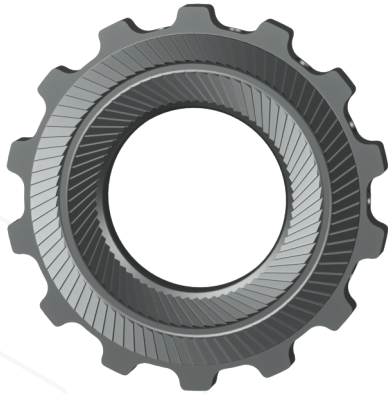
With imperial washer sizes ranging from ½" to 3" and metric sizes ranging from M14 to M80, the SerraLoc™ Reactionless Washer System can replace your standard through hardened washer, with a "reaction free" through hardened SerraLoc™ Washer eliminating nearly all commonly accepted dangers in producing accurate bolted connections. Custom SerraLoc™ Washers can be produced in almost any size to accommodate your most challenging applications.

With its unique "Safety-Lock" feature, the SerraLoc™ Reactionless Washer System provides the user with a fast positive connection to the fastener, which can eliminate injuries occurring with other systems. The weight of the tool disappears once the connection is made.



MEET SERRALOC™

REACTION WASHER AND BACKUP WASHER SYSTEM



Reaction Washer

NUT OR BOLT ROTATION SIDE

With its Patented Dual Row Bi-Directional Serrations, the SerraLoc™ Reaction Washer will grip nearly any standard flange surface with ease. While one serration ring resists tightening forces during makeup and the other serration ring resisting loosening forces during breakout, the SerraLoc will work repeatedly, time and time again, without the serrations of the washer or the flange being damaged. Simply place the dual serration side against the flange surface, and the smooth top side facing the nut or bolt head, and *voilà*: reactionless bolting. Adaptable to all hydraulic, pneumatic, electric, and battery powered torque tools, the SerraLoc Reaction Washer allows for true “hands free” operation.



Backup Washer

NUT OR BOLT HEAD LOCKING SIDE

With the same patented Dual Row Bi-Directional Serrations on the bottom, but with the added, “+V proprietary posi-lock grip” serrations on the top, the SerraLoc™ Backup Washer will completely lock down both the flange surface and the nut or bolt head eliminating any rotation on the opposite side of the flange. By removing the need for dangerous backup wrenches or other rotation resisting devices, the SerraLoc™ Backup Washer outperforms any competing washer in the market today. Even in vibratory applications, the SerraLoc™ Backup Washer won't lose the preload associated with other locking fasteners. (See Junkers Test Report per DIN25201-4) Add the SerraLoc™ Backup Washer and watch the savings roll in.

Both the SerraLoc™ Reaction Washer and Backup Washer can be used independent of each other depending upon the application such as a blind threaded hole where no washer or nut is present on the opposite side.

REACTIONLESS PERFECTION

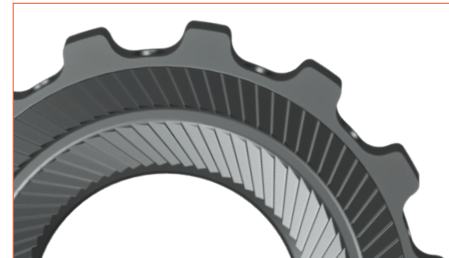
The SerraLoc™ Reaction and Backup Washer is an ASTM (F3394) approved solution for a quick and instant solution for improved safety, speed, and accuracy. Eliminating the need for bulky, unsafe, and often dangerous reaction arms or other contraptions, the SerraLoc™ solution ensures the most accurate bolt torque when compared to other “reaction required” systems.



COMPACT

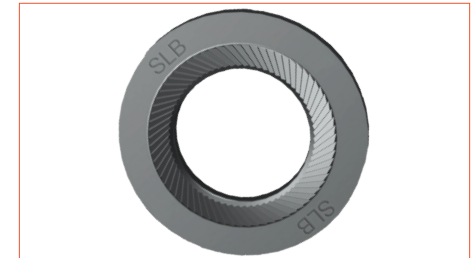
With its compact design, the SerraLoc™ reaction washer can fit where other washers don't. By utilizing a patented, castle style geometry around the periphery of the washer, the SerraLoc™ reaction washer can be connected with minimal encroachment into the adjacent fastener area allowing for use in the most restrictive applications.

- Allow sufficient bolt length to accommodate the thickness of the Reaction Washer and Backup Washer.
- No special nuts, bolts or threaded rods are required for utilizing the SerraLoc™ Washer.



DURABLE

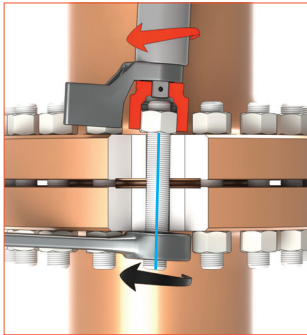
With heavy duty castles, the SerraLoc Reaction Washer is less susceptible to damage under high torque condition. But utilizing a non-tapered transition from castle to serration, the SerraLoc Reaction Washer can withstand repeated use without compromising the castle's strength and rigidity.



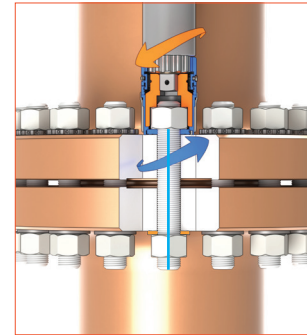
BACKUP WASHER

While it is the perfect companion to the Reaction Washer in through bolt conditions, the SerraLoc™ Backup Washer is a revolutionary product unto itself. With the ability to eliminate any backup wrench, the SerraLoc Backup Washer can be used in applications where traditional torque methods are applied. Providing safety, even when reaction arms and other abutment fixtures are used in through bolt applications, the SerraLoc™ Backup Washer greatly reduces the potential for accidental injury and speeds up traditional bolting processes with ease.

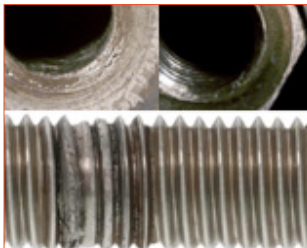
REACTION VS REACTIONLESS COMPARISON



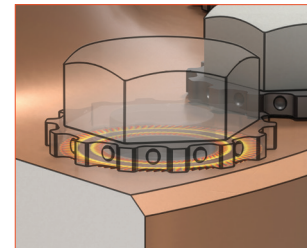
- Traditional Torquing Method with Bolt Side Load and Backup Wrench
- 1) Inaccurate Torque
 - 2) Damaged Components
 - 3) Increased Tool Inefficiency
 - 4) Early Tool Failure
 - 5) Reaction Pinch Points



- SerraLoc™ Reactionless Torque Tightening with Zero Bolt Side Load and No Backup Wrench
- 1) Reaction Free Operation
 - 2) Accurate Torque
 - 3) Increased Fastener Component Life
 - 4) Increased Tool Efficiency and Life Span
 - 5) Zero Pinch Points



- Traditional Side Loaded Torque Tightening
- 1) Damages Flange
 - 2) Damages Nut and Bolt Face
 - 3) Thread Galling
 - 4) Early Failure



- SerraLoc Washers provide a perfectly smooth, flat and handed surface for accurate torque output. With its Patented Dual Bi-Direction Serration geometry, flange damage becomes a thing of the past.
- 1) Zero Damage Flange
 - 2) Coated Washer Options to ensure frictional forces
 - 3) Zero Side Load for longer bolt life
 - 4) Nut face and bolt lubricant evenly compressed during tightening process



- Real World Danger with Real World Damage
- 1) Pitch Hazards
 - 2) Injury Claims
 - 3) Personnel Loss
 - 4) Life Changing Effects



- With The Reaction Washer Company, SAFETY always comes first.
- 1) Pitch Hazards - Eliminated
 - 2) Injury Claims due to Reaction Forces - Eliminated
 - 3) Personnel Loss due to Traditional Torque Methods - Eliminated
 - 4) Life Changing Effects – A Thing of the Past

- SIDE A: EXACTLY THE SAME AS CURRENT REACTION WASHER
- SIDE B: ADDS SERRATED RIDGE TO PREVIOUSLY SMOOTH SURFACE

REACTION WASHER SERRALOC+V

With its multi-patented design, the SerraLoc+V Reaction Washer offers unparalleled vibration loosening resistance when compared to **ALL** other locking washers on the market today. Its astounding average bolt load retention greater than **100%** when subjected to the

Junker shake test per DIN25201-4 B and ISO 16130. The SerraLoc+V, with its integrated fastener locking geometry and high load capacity castles, is your ultimate choice in hands free, anti-loosening Reaction Washers.

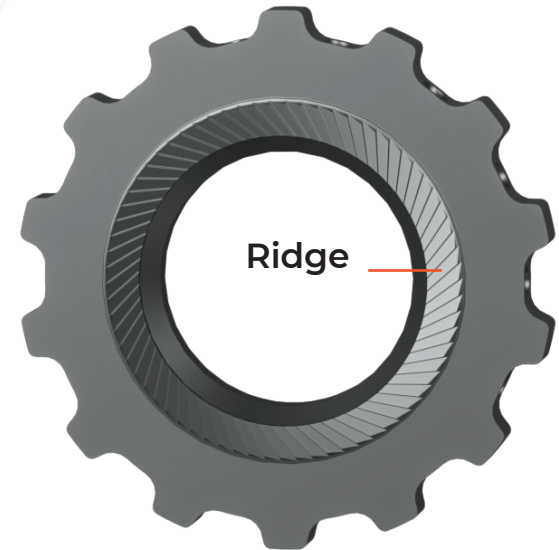


SIDE A: SERRATED SURFACE MARKINGS INSTALLED AGAINST THE FLANGE

SIDE B: SMOOTH SURFACE FACES THE NUT

ALL THE BENEFITS OF THE REACTION WASHER PLUS LOCKING!

SERRALOC
REACTION WASHER

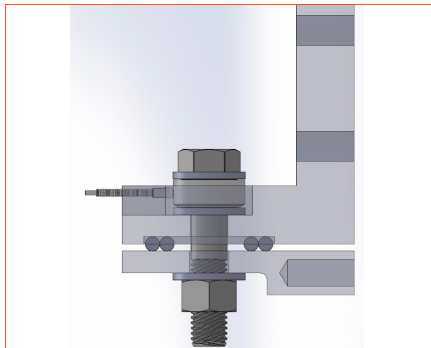


Ridge

SERRALOC+V
REACTION WASHER



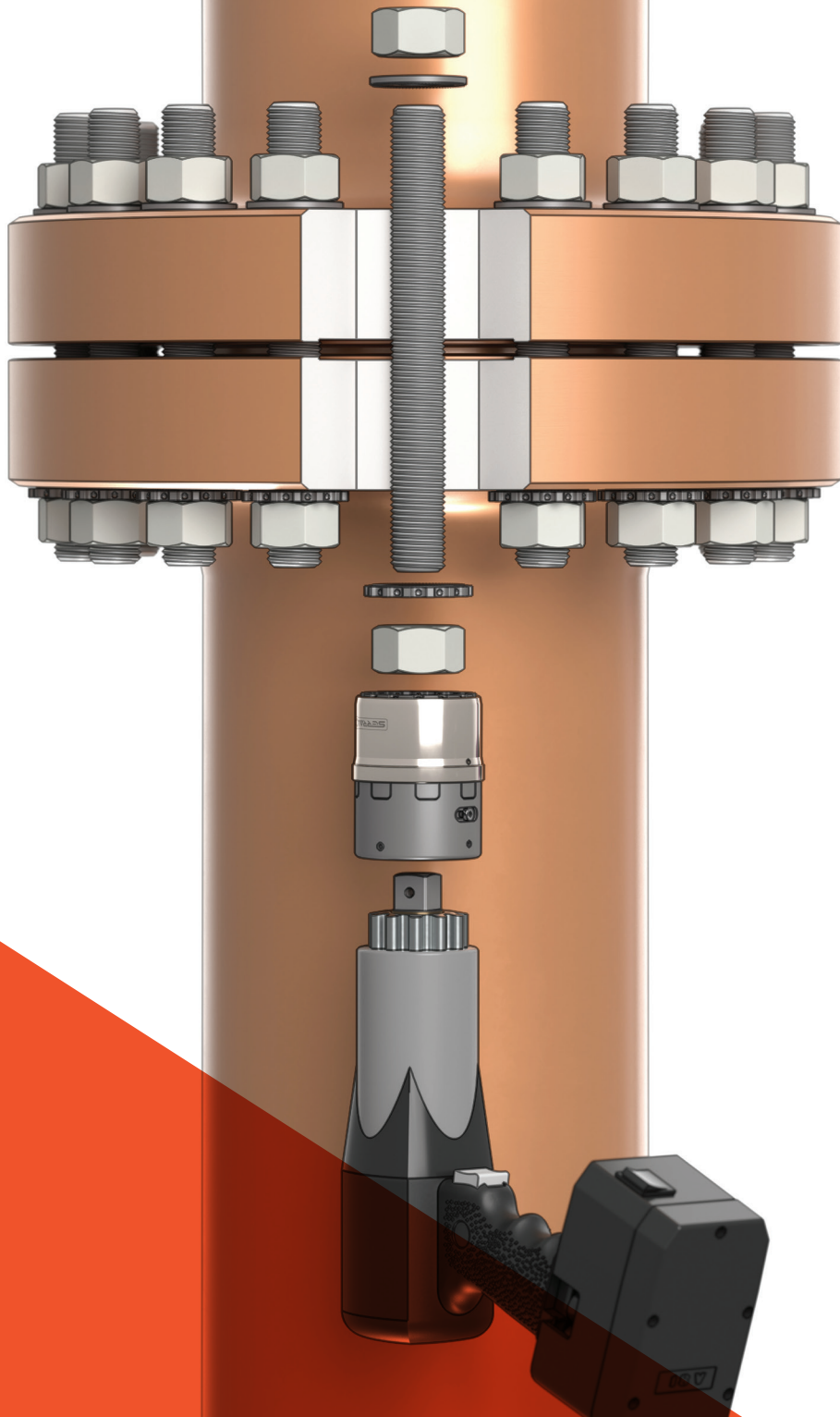
ANTI-LOOSENING REACTION WASHER IMPROVES BOLTED JOINT INTEGRITY



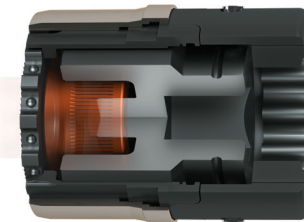
ANTI-LOOSENING

Standard pre-loaded fasteners can loosen as a result of relative motion between surfaces due to vibration. The SerraLoc+V Reaction Washer's serrated surface locks the nut when torque is applied so that no loosening occurs. The locking design has been verified, tested, and certified by a third party laboratory per DIN25201, which simulates the transverse forces that loosen the assembly.

THE ONLY REACTION WASHER WITH AN AVERAGE LOAD LOSS OF 0%.



REACTIONLESS TECHNOLOGY THAT DEFIES GRAVITY

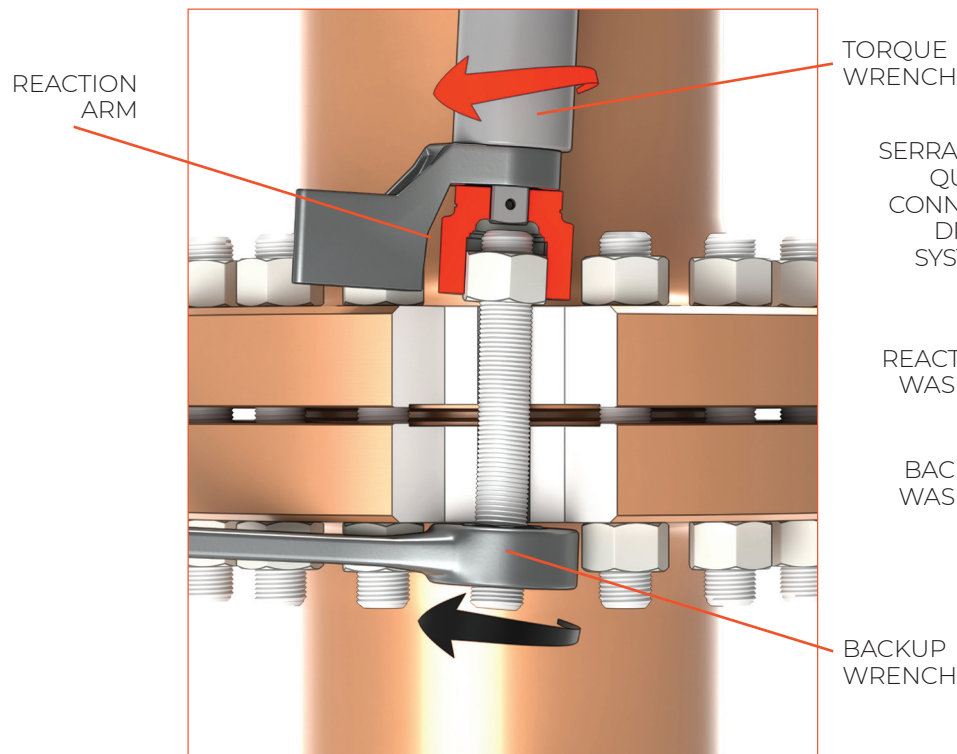


With the “Hands Free” SerraLoc Quick Connection Drive System, your imagination is the only limitation to this gravity defying feature at your fingertips.

- 1) Unparalleled Bolt Load Accuracy
- 2) Unparalleled Speed To The Make Up And Breakout Of Your Bolted Assemblies
- 3) Unparalleled Safety For Your Team Members

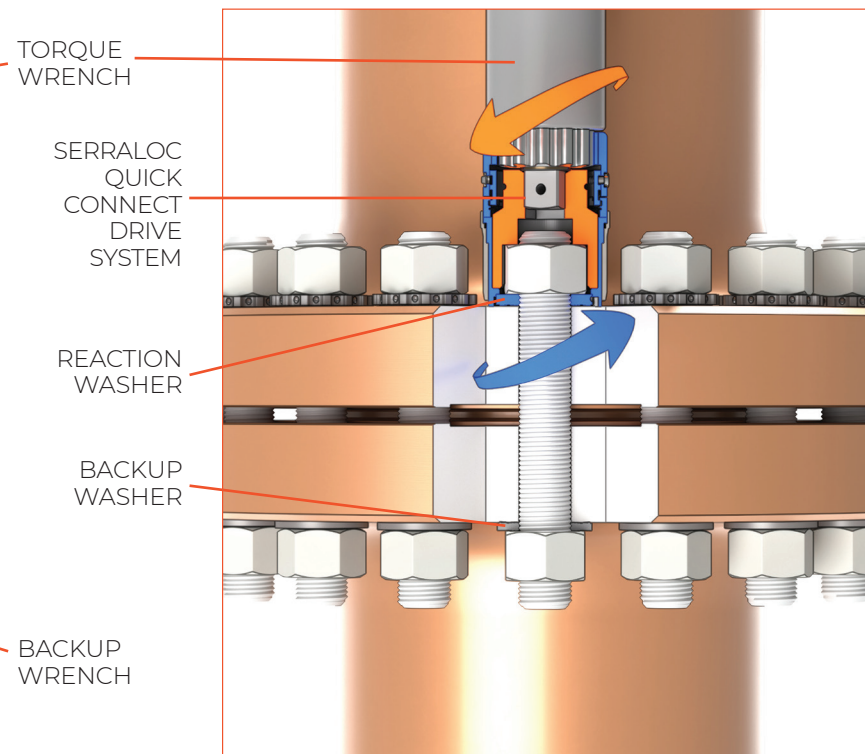
LINE OF FORCES

TRADITIONAL TORQUE TIGHTENING METHOD

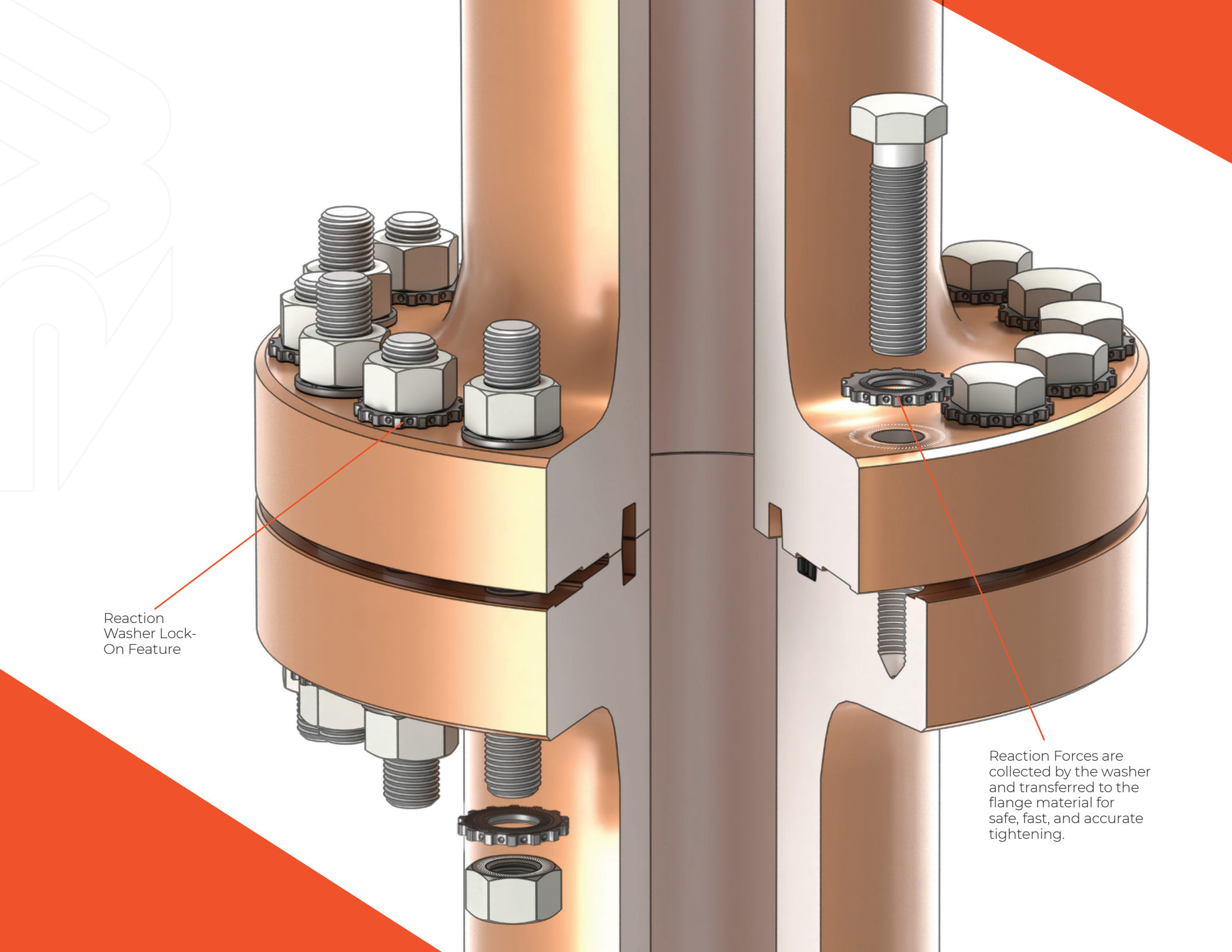


Reaction arms and other abutment fixtures induce shear and bending forces into the bolt or threaded rod. These forces can cause galling, bolt load inaccuracies, flange damage, and potential user injuries. These same forces induce early tool failure due to torsional damage to the torquing tools.

REACTIONLESS TIGHTENING WITH A REACTION WASHER AND BACKUP WASHER.

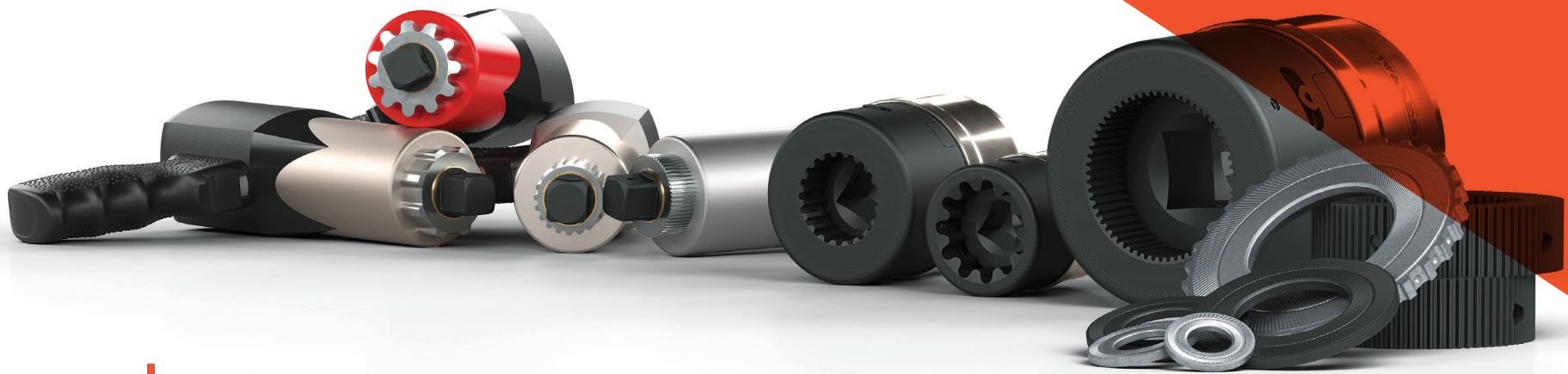


With action and reaction accruing around the central axis of a bolt or threaded rod, torsional side loading of the fastener components disappears. The Reaction Washer and Backup Washer eliminate these forces when connected to the Drive System.



Reaction Washer Lock-On Feature

Reaction Forces are collected by the washer and transferred to the flange material for safe, fast, and accurate tightening.



MASS ADAPTABILITY

ANY TOOL – ANY TIME

The SerraLoc Reaction Washer, Backup Washer, and Quick Connect Drive System can be adapted to operate with any brand of torque tool allowing for universal connection to your current equipment. With its torsion-free operation, every tool will enjoy a longer tool life and less down time when compared to all other reaction required tools.

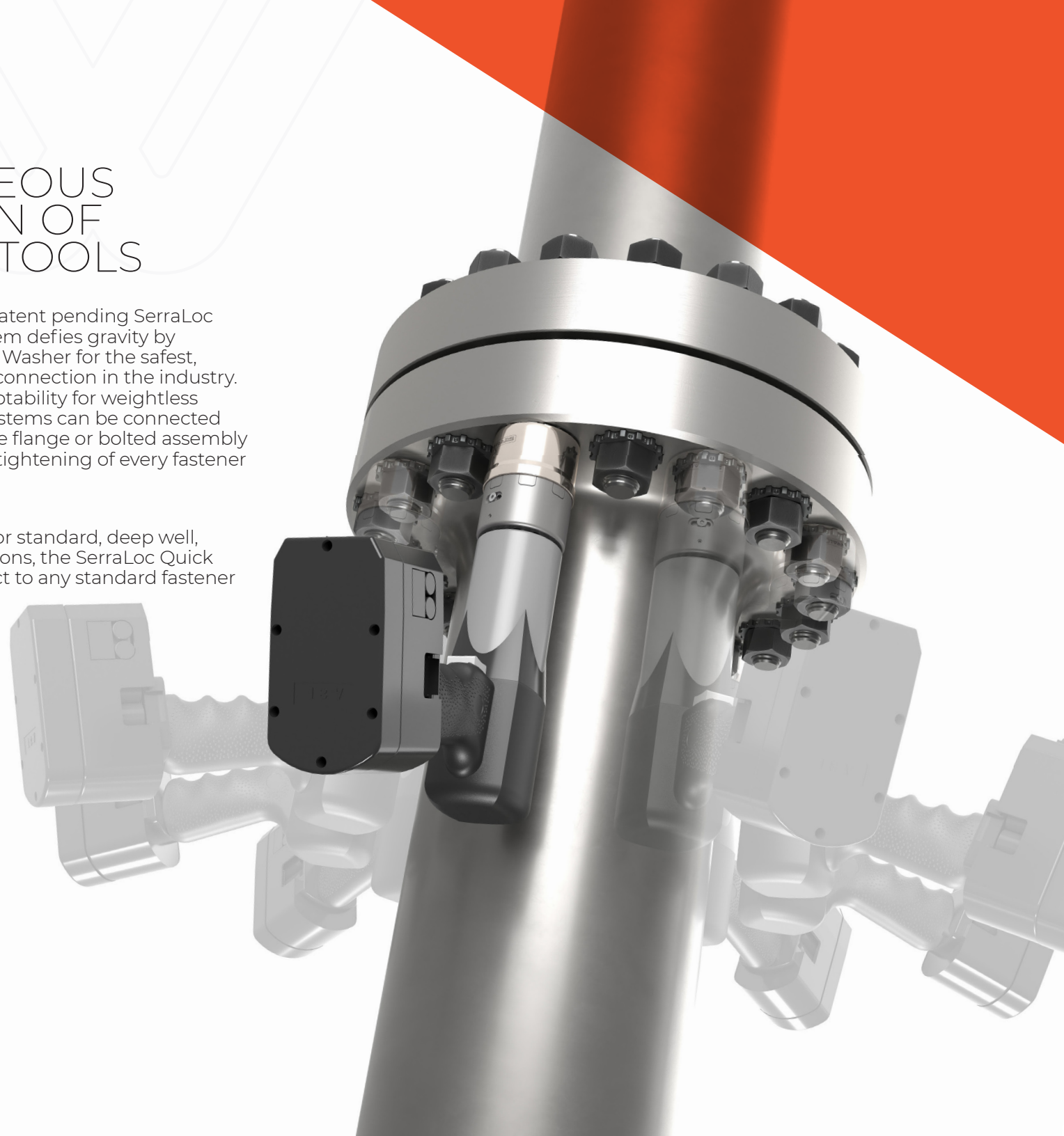


SIMULTANEOUS OPERATION OF MULTIPLE TOOLS

The multi-patented and patent pending SerraLoc Quick Connect Drive System defies gravity by locking onto the Reaction Washer for the safest, fastest, and most reliable connection in the industry. With its "Hands Free" adaptability for weightless function, multiple drive systems can be connected simultaneously around the flange or bolted assembly allowing for the potential tightening of every fastener at once.

With variations available for standard, deep well, and cap screw configurations, the SerraLoc Quick Connect Drive can connect to any standard fastener with a snap.

**There is simply
NO equal**



THE
REACTION WASHER
C O M P A N Y

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