

VELOCITY WASHER™ IN 30 SECONDS

Save money and increase production by eliminating seized nuts

SPEED

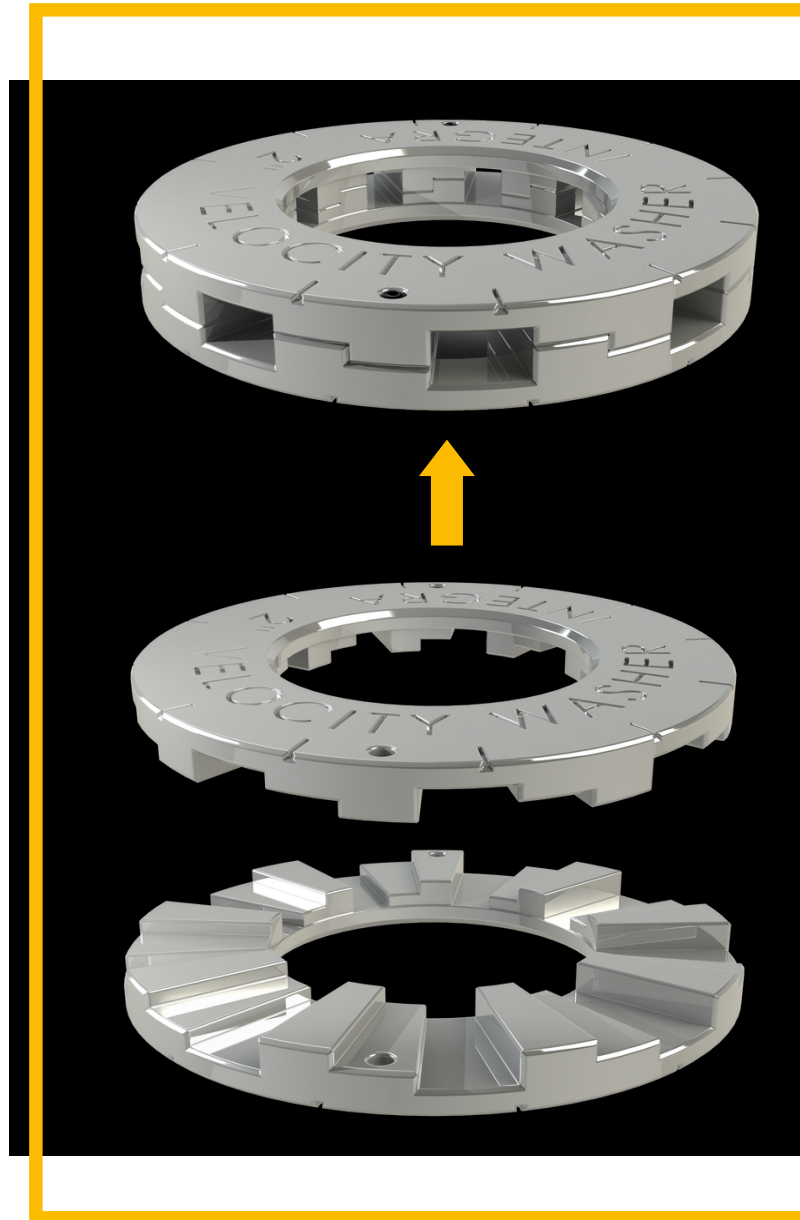
- 30X FASTER BREAKOUT
- INCREASE PRODUCTION
- LOWER LABOR COSTS

SAFETY

- NO HOT BOLTING
- NO TORCHING, MACHINING, AND NUT SPLITTING
- REDUCED TIME ON TOOLS

SIMPLICITY

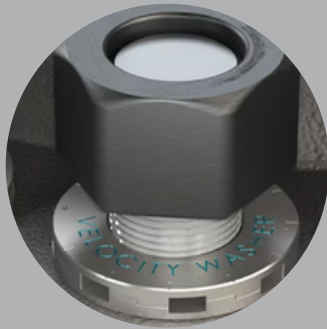
- FITS ANYWHERE A HARDENED WASHER FITS
- NO SPECIAL TOOLS REQUIRED
- 32 LOCATIONS AND 100-MILLION+ HOURS IN-SERVICE



VELOCITY WASHER™ : HOW IT WORKS

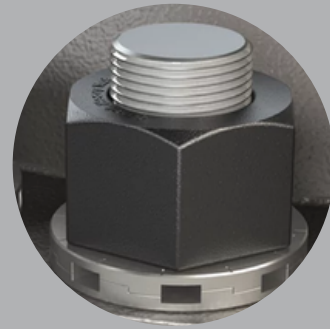
INSTALLATION

Place on Stud



To install, simply place the Velocity Washer on the stud. Due to its symmetric design, it can't be installed in the wrong orientation, delivering the simplest installation.

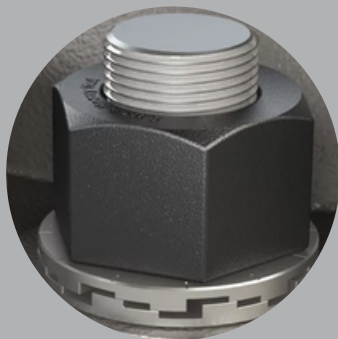
Torque the Nut



Torque the nut on using standard procedures: there are no special tools.

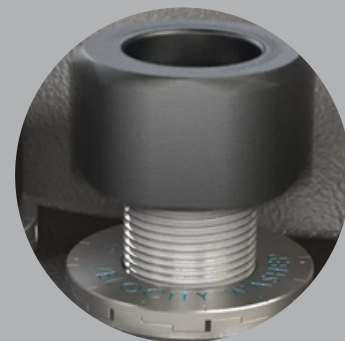
BREAKOUT

Turn the Nut



As always, turn the nut to the left. It will take less than one stroke of the torque wrench for the Velocity Washer to release all load.

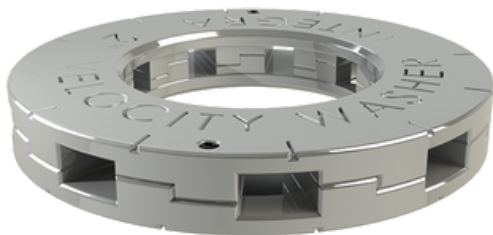
Run the Nut Off



Once the Velocity Washer pops, all load will be removed, allowing the nut to be easily run off.

SPECIFICATIONS SHEET

Nominal Bolt Size	Material	Hardness	Outer Diameter	Height	Activation Displacement	Activation Rotation	Stress Area	Washer-to-bolt Area Ratio	Maximum Bolt Load	Maximum Bolt Stress	Max Grip Length at Max Load
in	AISI	HRC	in	in	in	deg	in ²	-	kip	ksi	in
0.75	4340 HT	38-45	1.49	0.38	0.06	13.5	0.77	2.21	35	105	6
0.875	4340 HT	38-45	1.74	0.38	0.06	13.5	1.06	3.01	49	105	7
1	4340 HT	38-45	1.99	0.44	0.08	12.5	1.44	2.38	64	105	8
1.125	4340 HT	38-45	2.24	0.44	0.08	12.5	1.83	2.32	83	105	9
1.25	4340 HT	38-45	2.49	0.44	0.08	12.5	2.26	2.26	105	105	10
1.375	4340 HT	38-45	2.74	0.44	0.08	12.5	2.74	2.22	130	105	11
1.5	4340 HT	38-45	2.99	0.44	0.08	12.5	3.27	2.19	157	105	12
1.625	4340 HT	38-45	3.24	0.55	0.09	12.5	3.84	2.16	186	105	13
1.75	4340 HT	38-45	3.36	0.55	0.09	12.5	4.02	1.93	219	105	14
1.875	4340 HT	38-45	3.49	0.55	0.09	12.5	4.23	1.75	253	105	15
2	4340 HT	38-45	3.74	0.55	0.09	12.5	4.88	1.76	291	105	16
2.25	4340 HT	38-45	3.99	0.62	0.10	12.5	5.31	1.49	373	105	18
2.5	4340 HT	38-45	4.49	0.62	0.10	12.5	6.80	1.53	466	105	20
2.75	4340 HT	38-45	4.99	0.62	0.10	12.5	8.48	1.56	515	95	22
3	4340 HT	38-45	5.49	0.62	0.10	12.5	10.35	1.59	618	95	24
3.25	4340 HT	38-45	5.99	0.72	0.12	12.5	12.40	1.61	730	95	26
3.5	4340 HT	38-45	6.49	0.72	0.12	12.5	14.63	1.63	851	95	28
3.75	4340 HT	38-45	6.99	0.72	0.12	12.5	17.04	1.65	982	95	30
4	4340 HT	38-45	7.49	0.72	0.12	12.5	19.64	1.66	1122	95	32

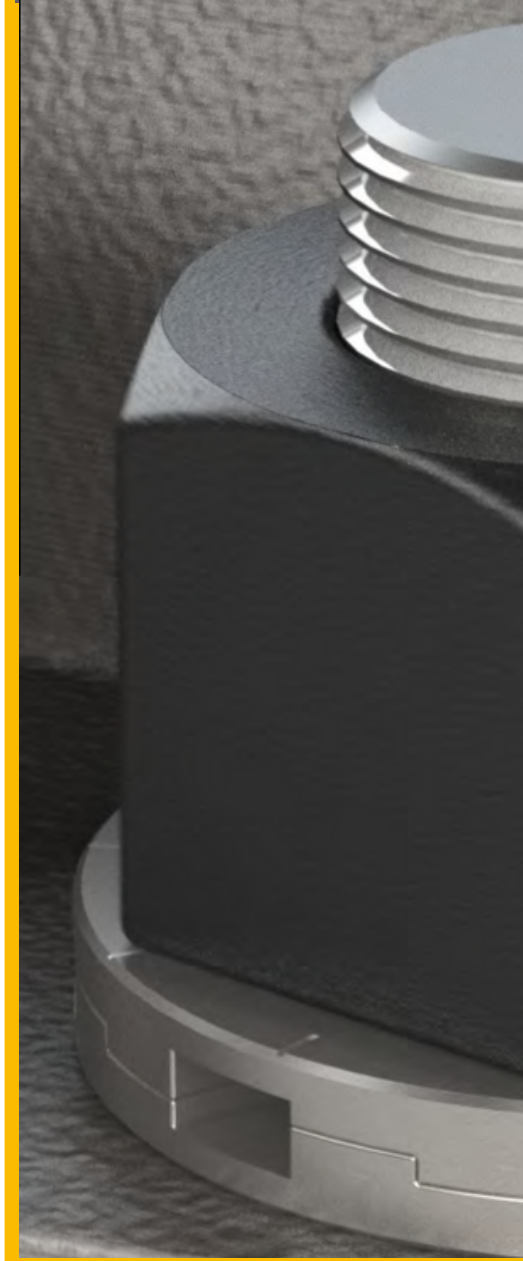
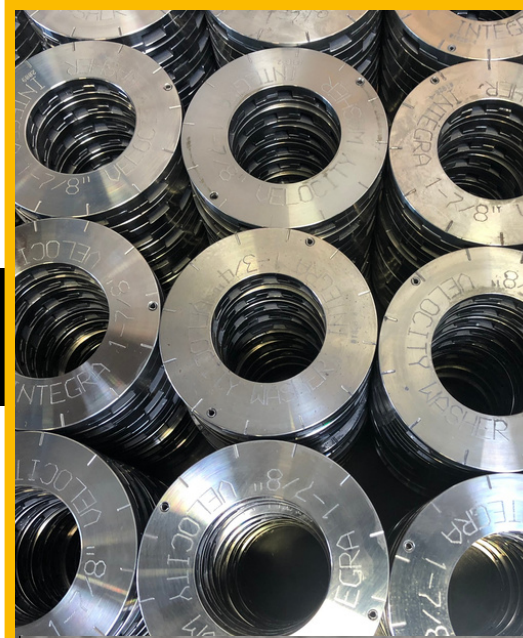
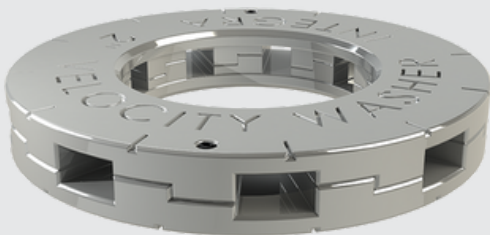


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SAMPLE INSTALLATION SHEET

USA & CANADA

- SHCU Reactor Outlets
2.25" VWs
- HCU Reformer Exchanger
1.625" VWs
- CFH Unit Pipe Flanges
1.50" VWs
- 3HDS Unit Reactor Flanges
3.00" VWs
- Reactor Tops
Multiple Sizes
- DHT Unit Goose Neck
Multiple Sizes
- Reactor Manway/Head
3.50" VWs
- Reactor Agitator
2.50" VWs
- Reactor Seal Mount
3.25" VWs
- HCU Unit All Flanges
Multiple Sizes
- Channel Heads
Multiple Sizes
- Reactor Outlets
Multiple Sizes
- HCU Reformer Reactor
1.625" VWs
- Piping Blinds
2.50" VWs
- Reformer Furnace Duct Manway
Multiple Sizes
- Piping Flanges
1.50" VWs
- BD Exchangers
3.50" VWs
- RFCCU Blind
2.25" VWs
- Compressor Drum (HCU)
Multiple Sizes
- Reactor Goose Neck
Multiple Sizes
- HDS Flanges
1.625" VWs
- Cooler Large Flange
1.875" VWs
- Furnace Blinds
Multiple Sizes
- Pigging Spools
Multiple Sizes

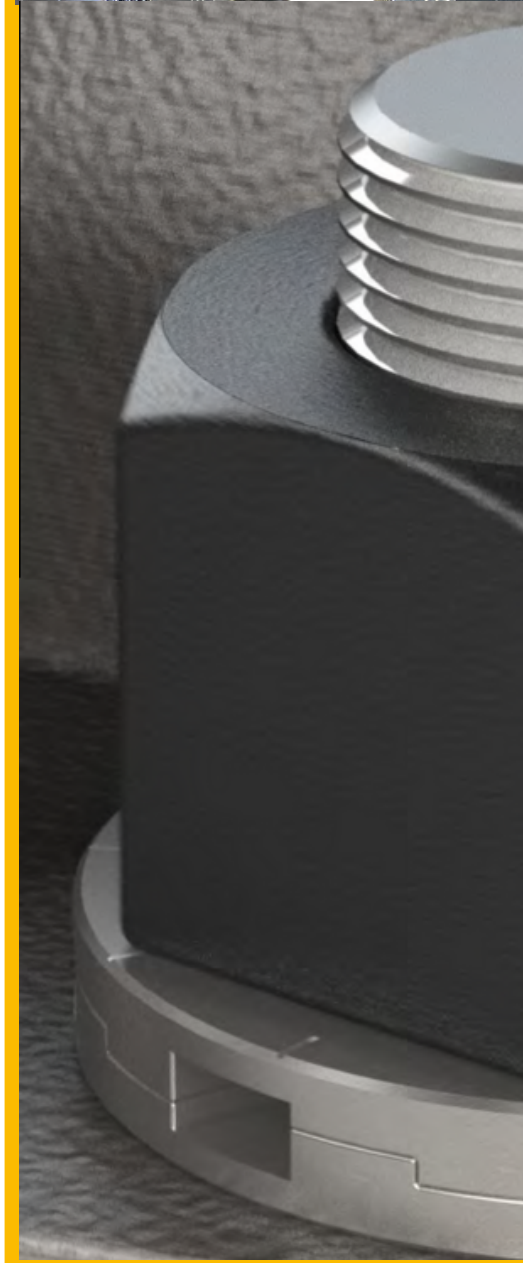


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CUSTOMER LIST

Flexitallic

VELOCITY WASHER™



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VIDEO LINKS

Flexitallic

VELOCITY WASHER™

HOW IT WORKS:

https://youtu.be/SHHBN1_an5c

VELOCITY IN 15-SECONDS:

<https://youtu.be/TjhHgURvj2s>

DISASSEMBLY TEST:

<https://youtu.be/RrMBiALVLY>

1-MIN CASE STUDY:

<https://youtu.be/MgZhpqxBXAg>

VIBRATION-RESISTANCE TESTING:

<https://youtu.be/h5LY3BeT9TA>

43-SECOND NUT RUNNER BREAKOUT:

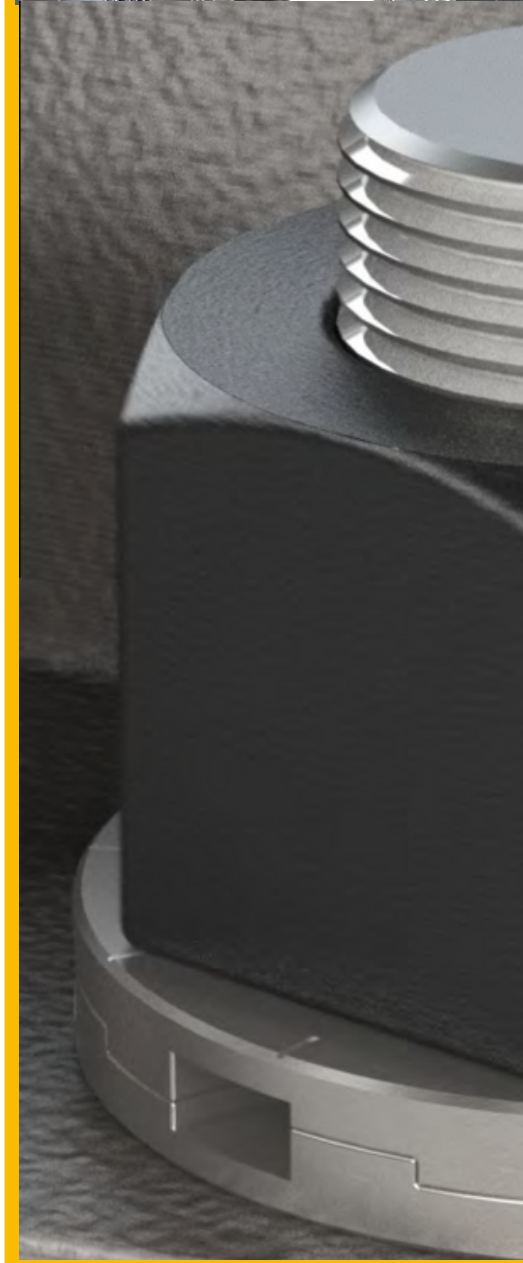
<https://youtu.be/eblv4e3Xvvg>

SLOW MOTION DE-TORQUING:

<https://youtu.be/96NzkMbWHSs>

BORING INSTALLATION, EXCITING ROI:

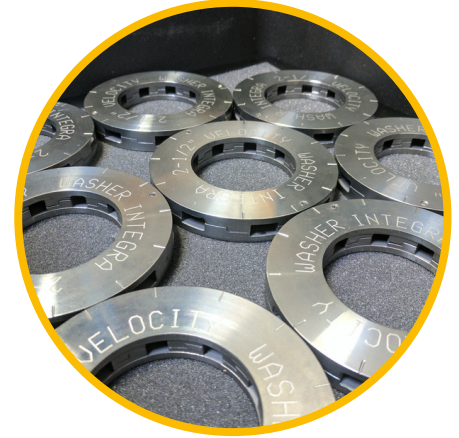
<https://youtu.be/eoYtp3Tzg18>



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VELOCITY WASHER™

Velocity Washer is a patented technology designed to give you 30x faster breakouts.
No seized nuts = Less cost + More uptime
Speed Safety Simplicity



OUR WORK WITH

- Started in 2018
- Targeted Areas:
 - Channel heads on large, process exchangers
 - Minicone at bottom of reactor

RESULTS

- **Total Increased Production : 112h**
 - Elimination Of Galling Delays: 96h
 - Mechanical Work Reduction: 16h
 - Hardware Replacement Reduction: 126 Fastener Sets
 - Labor Reduction: 80 Manhours



“Two issues were addressed with this solution. The first is **SAFETY**. When the nuts locked up, the only way to remove them was to torch cut the studs. This involves bringing an **open flame** into a process area and using it in a relatively tight space. It also introduces **integrity concerns...**

The second benefit is **time savings**. Attempting to break the nuts and then having to torch cut them could take **4-5hrs**. With the Velocity Washers™ the FBR minicone was dropped in just over **1hr.**”

- Dow's Newsletter



Flexitallic®



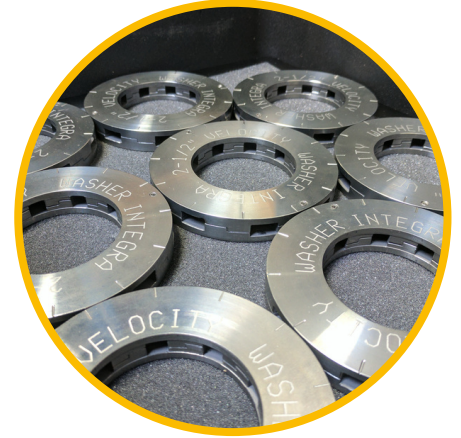
*Velocity Washer is a patented product.

VELOCITY WASHER™

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OUR WORK WITH cenovus ENERGY

Cover Plate Removal (32 x 3 1/4" Bolts)

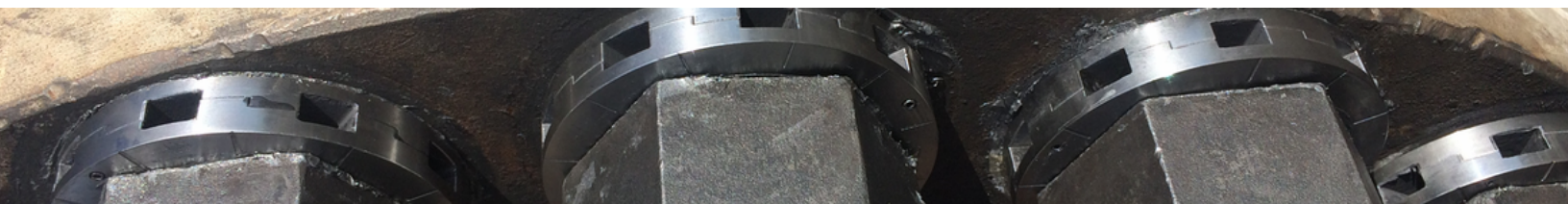
RESULTS

WITHOUT VELOCITY WASHER

- 2 days to remove cover plate →
- Torch to remove H/W →
- High temp & OEM paint on threads →
- Production offline to perform service →
- Critical path →

WITH VELOCITY WASHER

- 2 hours to disassemble
- Zero stuck studs
- Zero hot work
- Zero stud replacement
- Zero damage to equipment



velocitywasher.com

flexitallic.com

POWER TO THE FUTURE