Patented

Advanced® Couplings Limited

ACL® SH Safety Clamp

Double hinge pharmaceutical clamp

The new **SH Safety Clamp** is based on the design of the widely accepted 316 stainless steel SH clamp, designed and manufactured by Advanced Couplings Ltd, which includes the 'Omega' internal profile geometry known for its exceptional clamping efficiency. The SH style Safety Clamp's unique feature is the lower portion of the bolt is wider than the opening in the clamp's gate. In use, the wing nut must be deliberately loosened so the clamp gate can be lifted above the wider part of the bolt before the clamp can be completely opened.

Setting the Standard

"While a maintenance worker was walking through a biotech production area, his pants leg brushed the joint clamp on a steam line. The clamp's wing nut, which had backed-off just two turns due to temperature cycling and vibration, pulled the swing bolt through the clamp which resulted in total joint failure. The sudden release of high-pressure steam severely injured the worker and disrupted production for hours."

This scenario not only could happen, but continues to happen, and frequently enough that the need for an improved, failure-resistant clamp became obvious within the industry. That need has been met by Advanced Couplings Ltd. The CE compliant design makes it impossible for the swing bolt to release unless the wing nut is significantly loosened, as many as ten turns rather than as few as 1-1/2 turns in the conventional design.

While protection from high-temperature/ high-pressure steam line joint failure was the primary application for these clamps, they also provide protection in systems employing various chemical components, reagents and biological materials. In these applications they not only respond to the need for improved plant safety, they help prevent contamination of the production area and adjacent equipment, and eliminate product loss. Also, they may be seen as a positive factor by your liability insurance carrier.

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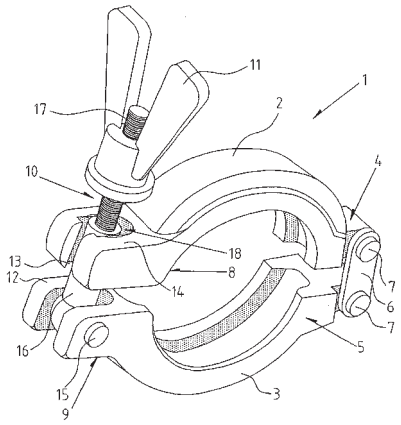
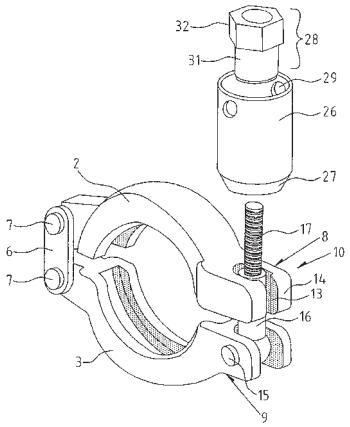
Patented Design

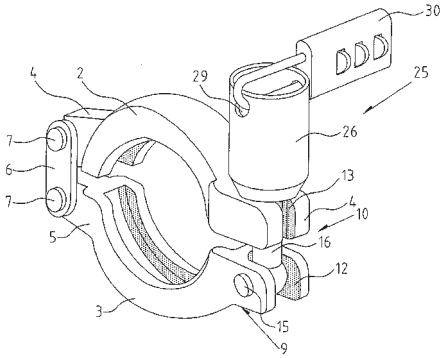
The patented safety clamp design has been in use for over a decade. It has proven to be indispensable for the safety conscious engineers and managers all over the globe. The design enables the leak-before-burst scenario that is at the heart of ASME BPVC codes and standards.

ACL also offers varying styles of the SH Safety Clamp with the Shrouded Safety Clamp and Lock-Out Safety Clamp. Both variations are designed to further increase the safety of hazardous high temperature piping lines often associated with steam and CIP / SIP cleaning processes.

Patent Numbers
7.883.121, 125175 and 1693609







SH Safety Clamp Options

Safety Hex Nut – SAFX
The Safety Hex Nut Clamp is based around the design principal of the standard SH safety clamp. This new variation benefits from the added safety feature of a hex nut replacing the wing nut. Using the hex nut guarantees that the clamp cannot be loosened by hand.

Shrouded Safety Clamp – SAFS
The Shrouded Safety Clamp is based around the design principal of the standard SH safety clamp. This new variation benefits from the added safety feature of a hex nut replacing the wing nut. Using the hex nut guarantees that the clamp cannot be loosened by hand. This, coupled with the added security of the free rotating nut shroud, determines that the clamp can only be released using the correct socket adapter, alleviating problems where the piping line can easily be tampered with or accidentally released.

Lock-out Safety Clamp – SAFL
The Lock-out Safety Clamp is an advanced version of the Shrouded Safety Clamp. The wing-nut has again been replaced with a shrouded hex nut. The shroud, however, is extended in length and modified to accept a number-coded or key-operated padlock. Once the clamp has been assembled, the padlock's shackle can be passed through the holes in the nut shroud, stopping the hexagon head of the nut from being accessed.

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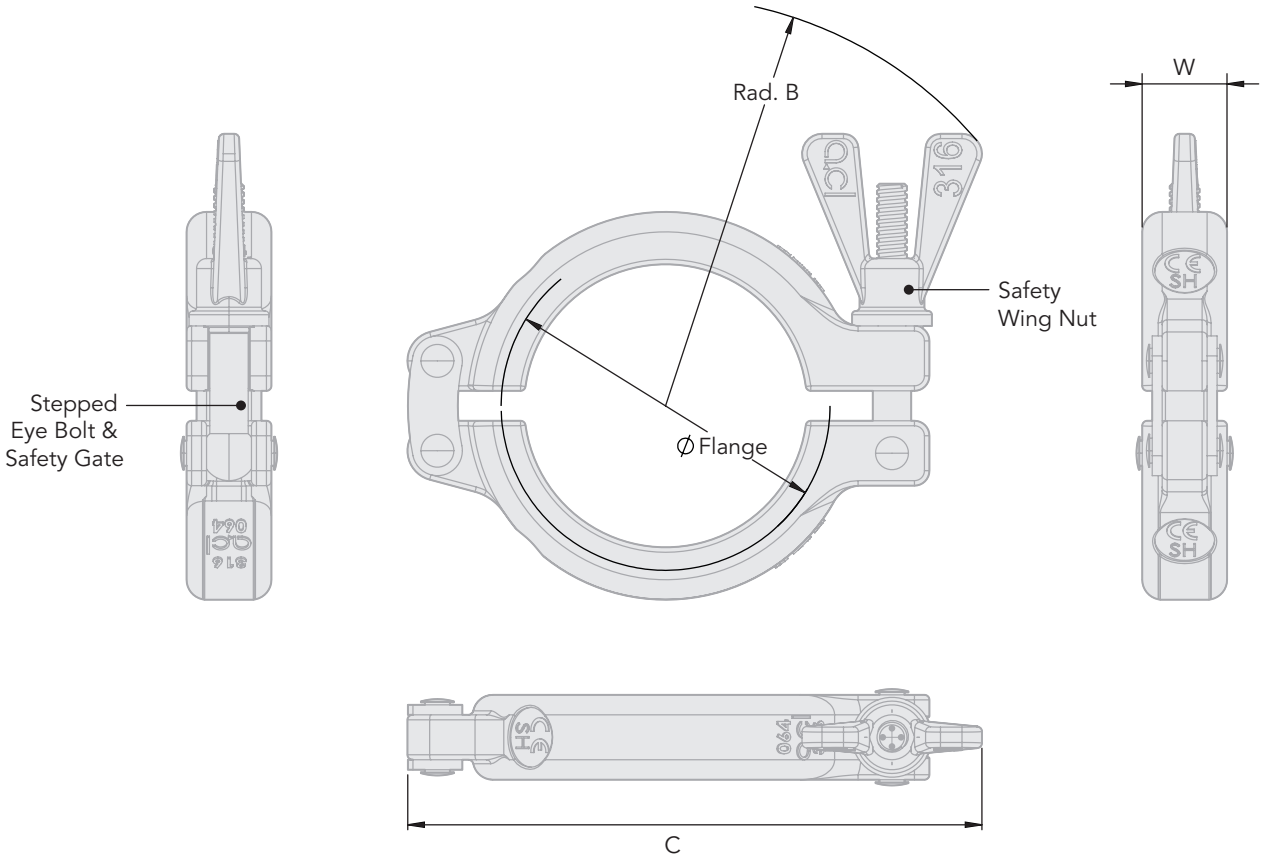
Dimensions



Clamp Sizes

Nominal Clamp Size (inches)	Flange Ø (mm)	Radius B (mm)	Length C (mm)	Width W (mm)	Mass (Kg)	MAWP Barg (150C)	Max Test Pressure Barg	SKU
½ - ¾	25	63	75	17	0.15	50	100	CL.SAF.0050
1 - 1½	50.5	77	102	17	0.25	50	100	CL.SAF.0100
2	64	93	123	17	0.33	50	100	CL.SAF.0200
2½	77.5	100	140	17	0.38	50	100	CL.SAF.0250
3	91	105	150	17	0.44	40	80	CL.SAF.0300
3½	106	110	165	17	0.44	40	80	CL.SAF.0350
4	119	119	185	17	0.57	35	70	CL.SAF.0400
4½	130	119	191	17	0.6	30	60	CL.SAF.0450
5	144	131	215	19	0.75	30	60	CL.SAF.0500
5½	155	148	265	24	1.47	30	60	CL.SAF.0550
6	167	152	277	24	1.67	30	60	CL.SAF.0600
6 5/8	183	164	297	24	1.69	25	50	CL.SAF.0658
8	217	184	332	24	2.19	20	40	CL.SAF.0800
8 5/8	233	185	333	24	2.34	20	40	CL.SAF.0858
10	268	205	382	24	2.78	16	32	CL.SAF.1000
10 5/8	286	213	405	24	2.97	16	32	CL.SAF.1058
12	319	242	458	24	3.69	10	20	CL.SAF.1200
12 5/8	338	243	463	24	3.37	10	20	CL.SAF.1258

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Material Standards

Standard	Description
ASME SA351 / 351 M	Clamp segments – CF8M (Cast 316)
ASME SA580 / 580 M	Eyebolts – Hot forged – 316
ASME SA580 / 580 M	Cold forged rivets (316)
ASME SA351 / 351 M	Wingnuts – CF8M (Cast 316)
ASME SA240 / 240 M	Hinge plates – 316
ASME SA479 / 479 M	Hex nuts – 316

Clamp segment production standard

- Investment cast using ASME SA 351 / 351 M Stainless - Steels for pressure purposes
- Pickled and passivated - this process removes the 'free iron' particles from the surface that would 'rust'
- Heat treated according to ASME SA 351 / 351 M
- Barrel polished and sized using hydraulic press:
  - Ensures uniformity between the clamps
  - Uniform extrusion of the gasket in a union
  - Reduces 're-torquing' of clamp after pressure/temperature cycles

Quality Control

- Pressure tested by three independent bodies:
  - Forbairt, TUV SUD and FORCE Denmark
  - Also tested in-house as part of ongoing improvement process
- XRF (X-Ray Fluorescence) and PMI (Positive Material Identification) to ensure correct chemical composition
- Castings visually checked to ensure no cracks/blowholes to comply with ASME SA 351 / 351 M
- Quality control, research and testing constantly evolving to maintain the highest standard
- ASME SA 580 / A580 M Eyebolt threads controlled in three locations to ensure correct tolerance to minimize the risk of galling
- ASME SA 580 / A580 M Rivets are checked to ensure mechanical properties are within manufacturing limits; otherwise could deform and gall in holes

Documentation and Traceability

- 3.1 certificate (heat number stamped on casting at foundry)
- The castings are stamped according to the pour date at the foundry
- The 4/5 digit number is unique to the size and style of the clamp

Continuous improvement

ACL prides itself as being the benchmark within the hygienic industry for sanitary clamps. In order to stay ahead of the curve, the designs and standards the clamps are produced to, are under constant review.

Quality Assurance

The ACL Quality Management System is certified according to EN ISO 9001:2015. We ensure that our suppliers also maintain a certified Quality Management System.

All materials used in the fabrication of the SH Clamp conform to ASME Standards.

Further Information

For detailed selection criteria, technical information, installation guidelines or to contact ACL, please visit our website:

www.advanced-couplings.com

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