



The GCR-SW™ Series Reverse Buckling Rupture Disk Assembly

Process View



Side View



US Patents 5,996,605 and 6,178,983 apply; International patents pending.

Pictured above, the GCR-SW™ series reverse buckling rupture disk with SAF™ (Structural Apex Forming) technology, offers a wide range of burst pressures for hygienic applications in the pharmaceutical, biotechnology and food industries.

The GCR-SW can be installed using standard sanitary clamps (tri-clamp or equivalent) and is not compromised by improper torque or misaligned ferrules.

Integral gaskets are no longer necessary as a disk component, eliminating issues with gasket shelf life, gasket-to-process compatibility and process/sterilization effects.

Designed for non-fragmentation, the open disk petal is contained inside the assembly after activation, minimizing the risk of damage to equipment and potential injury to the operator when removing the disk for replacement.

Reverse Buckling and SAF™ Technology

The dome of the GCR-SW reverses and opens by shearing around the circumferential score. Additionally, the GCR-SW incorporates SAF™ (Structural Apex Forming) technology, which uses thicker material making the disk more robust and allows low burst pressure capability, excellent opening characteristics, greater cycle resistance and higher operating ratios. The combination of these technologies and the absence of integral gaskets, makes the GCR-SW ideal for autoclave, homogenizers, CIP, SIP and other applications with moderate-to-severe pressure cycling and temperature environments.

Features

- One disk design for both gas and liquid service
- "Fail-safe" design damage safety ratio < 1.0
- Rupture disk is not influenced by erroneous torque or ferrule misalignment
- Ideal for CIP / SIP service
- 8 to 16 micro-inch typical disk surface finish
- Suitable for operating pressures up to 90% of marked burst pressure* or 95% of the specified minimum burst pressure (higher operating ratios may be available)
- Meets ASME BPE standards. CE marking also available
- Designed for non-fragmentation
- 0% standard Manufacturing Design Range - optional -5%, -10%
- Withstands full vacuum at all available burst pressures
- Available SAS™ (Sanitary Alert Sensor) for burst indication or LDS (Leak Detector Sensor) with leak sensing capability
- 316L stainless steel as standard. Alternative materials are available on request
- Laser etched data on the assembly body is easy to read and doesn't extend from the device as a conventional disk tag
- Easy to install or reinstall due to one-piece construction
- Wide range of available pressures
- SAF™ technology enables very low burst pressures to be achieved and unparalleled service life

* At marked burst pressures of 40 psig (2.76barg) and below, the recommended maximum operating pressure is 90% of the marked burst pressure, less 2 psig (0.138barg) tolerance



Pictured above, the GCR-SW™ installs easily between existing standard sanitary fittings. Also pictured is a sanitary alert sensor (SAS™) which signals when an overpressure event occurs. The SAS™ sensor fits between the GCR-SW™ and outlet fitting.

Installation

The GCR-SW installs directly between sanitary ferrule connections and is secured using standard sanitary clamps (Tri-Clamp® or equivalent).

Manufacturing Design Range

0% standard MDR (Manufacturing Design Range) - The user's requested burst pressure will be the marked burst pressure. An optional MDR of -5% and -10% may be selected as operating conditions permit. The MDR is applied only to the minus side of the requested burst pressure.

MDR is a range of pressures within, which the marked burst pressure must fall to be acceptable for a particular requirement as agreed upon between the rupture disk manufacturer and the user or their agent.

Example:

- Requested burst pressure 100 psig (6.89barg)
- Agreed MDR - 10%
- Therefore the marked burst pressure shall be between 90 psig (6.21barg) and 100 psig (6.89barg)

Burst Tolerance	
Marked burst pressure	Burst tolerance
≤40 psig (2.76bar)	±2 psig (0.14bar)
>40 psig (2.76bar)	±5%

The GCR series disks may also be marked with a minimum / maximum burst pressure or the specified burst pressure and +/- performance tolerance to meet the requirements of the CE standard.

Flow Performance

The GCR-SW reverse buckling disk has been specifically developed to produce superior flow performance at all burst pressures in gas or liquid service. The circular score on the disk's dome, coupled with the nonrestrictive hinge on the outlet side of the disk, ensures an excellent pressure relief opening in all service phases. Flow resistance factor, K_R may be used to determine the relieving capacity of a system according to the ASME and CE codes and standards. Individual K_R values have been established for both gas and liquid service for the disk. K_R values are available at www.bsbsystems.com.

GCR-SW Advantages

- Simple:** One-piece disk and fitting construction, fewer components for a faster, easier and more reliable installation
- Reliable:** Disk fully contained inside the fitting, protecting it from damage during installation and handling
- Flexible:** One-piece design allows for installation and re-installation during inspection or equipment mobilization
- Safer:** Sharp disk petal is fully contained upon activation, preventing injury during removal and no protruding disk tag
- Versatile:** Ideal for horizontal and vertical installation where standard sanitary disks are difficult to remove and install
- Increased shelf life:** No elastomer gaskets with expiration dates, full metal fusion-welded construction
- Smart design:** Single piece, full metal disk and outlet eliminate the influence from misaligned or unsupported discharge piping as well as excessive torque.
- Non-torque sensitive:** Compatible with standard or high-pressure clamps
- Autoclavable:** No integral gasket eliminates the issues related to gasket material and process compatibility.
- Welded and assembled using ISO 3834-2, the highest quality standard in fusion welding
- 100% leak tight construction
- Fully Electropolished options are available
- Overall height can be modified for retrofit and custom applications

Disk Specification Min / Max Burst Pressure at 72°F (22°C)									
Sanitary Fitting		Burst Pressure				Overall Height		OD	
Nominal Disk Size		Min		Max					
in	mm	psi	bar	psi	bar	in	mm	in	mm
1.5	40	10	0.69	300	20.7	1.77	45	1.98	50.4
2	50	10	0.69	300	20.7	2.14	54.4	2.52	63.9
3	80	10	0.69	175	12.1	2.97	75.4	3.58	90.9
4	100	10	0.69	75	5.2	4.65	118.2	4.68	118.9

Other burst pressures may be available - consult BS&B

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