



BS&B SAFETY SYSTEMS, L.L.C.

RUPTURE DISK SELECTION GUIDE



SELECTION

BS&B Safety Systems, Inc. and its affiliates offer a broad range of rupture disks. All act as relief devices which are fast, accurate and dependable.

By offering a wide selection of rupture disks, BS&B Safety Systems, Inc. and its affiliates can meet your specific needs.

- Disk sizes ranging from 1/8" (3mm) to 44" (1120mm)
- Pressures from in. WC (mbar g) to 100,000 psig (6900 bar g)
- Custom engineered and designed rupture disks

SERVICE

BS&B Safety Systems, Inc. and its affiliates offer a network of worldwide engineering, manufacturing and support services. Plus access to more than 90 fully trained representative companies

Manufacturing facilities located in:

- Tulsa, Oklahoma, USA
- Limerick, Ireland
- Chennai, (Madras), India
- Sao Paulo, Brazil
- Houston, Texas, USA

CODES & STANDARDS

BS&B Safety Systems, Inc. is the world leader in the design and manufacture of non reclosing pressure relief devices.

Since designing the first rupture disk in 1931, BS&B Safety Systems, Inc. has set the standards in the industry.

- Originated patents on 90% of all rupture disk products
- Proven commitment to quality and innovation

Our rupture disks are manufactured in conformance with the requirements of the following international codes and standards.

- ASME Sections VIII & III (UD stamped)
- EC Pressure Equipment Directive
- EN ISO 4126-2 (pending)
- BS 2915
- ISO 6718
- TUV AD Merkblatt A1
- SVTI
- Stoomwezen
- ISO 9001 Quality System Certification



OVER
65
YEARS
EXPERIENCE

	TYPE	CATALOG NO.	DESCRIPTION	SIZE INCHES/mm	BURST PRESSURE PSIG/BAR	MATERIAL*
STA-SAF® SYSTEM	SK _R TM  77-4003	The SK _R is the first rupture disk developed and flow tested for optimised flow characteristics in both gas and liquid service. At the burst pressure the disk's dome reverses and opens by shearing around a circular score line. The energy absorbing hinge ensures that the disk's petal is retained on opening, avoiding fragmentation. Low K _R value 0.37 in gas service. <i>Worldwide patents pending</i>	1 - 10 25 - 250	15 - 500 1.03 - 34.47	Standard (not Aluminum) Special	
	S-90 TM  77-4001	Reverse buckling disk that bursts along scored (pre-weakened) lines. Even if damaged or installed incorrectly, it will still open at 1.5 times or less its rated pressure. <i>US Patents 4441350, 4481850</i>	1 - 30 25 - 750	20 - 1,000 1.38 - 68.95	Standard and Hastelloy Alloy C-276	
	JRS TM  77-4001	JAWS TM is a reverse buckling disk designed for lower pressures than the S-90 TM . It reverses and opens along a teeth ring attached to the disk. <i>US Patent 4236648</i>	1 - 36 25 - 900	5 - 180 0.35 - 12.41	Standard (not Aluminum) Special	
	RLS TM  77-4001	LIQUIFLO TM reverse buckling disk designed for liquid and gas service. The circular scored disk with hinge gives relief opening in either full liquid or gas systems. High and low burst pressure capabilities. <i>US Patent 4404982</i>	1 - 18 25 - 450	25 - 2,000 1.73 - 137.89	Standard (not Aluminum) Special	
ECO-SAF TM SYSTEM	ECR TM  77-4012	The ECR TM offers the lowest burst pressures available from a reverse buckling disk. The disk relieves excess pressure or vacuum by reversing and opening around the perimeter of the dome. The disk is fitted with gaskets to achieve a sealed construction. A two-way disk option is available.	1 - 24 25 - 600	1 - 180 0.069 - 12.41	Standard (not Aluminum) Special (not Titanium)	
SURE-SAF® SYSTEM	CSR TM  77-4009	The CSR TM , a reverse buckling disk with a circular score line at the perimeter of the dome. When overpressure occurs, the disk reverses, shears along the score line and folds around the pivot in the Safety Head outlet. The pivot ensures the disk petal is retained after bursting. If damaged or installed upside down, the disk will open below its marked burst pressure. <i>US Patents 5167337, 4751938</i>	1 - 8 25 - 200	30 - 500 2.07 - 34.47	Standard (not Titanium) and Hastelloy Alloy C-276	
OTHER DISK TYPES	RB-90®  77-4006	Reverse Buckling Disk of solid metal which snaps through and cuts open along four razor sharp blades located in the holder outlet.	1 - 36 25 - 900	10 - 1,800 0.69 - 124.1	Standard Special (not Titanium)	
	XN-85 TM  77-5003	A tension loaded disk which is scored after the disk is crowned, allowing a higher operating ratio of 85% of the marked burst pressure. Often selected for polymerization processes. <i>US Patents 4441350, 4481850</i>	1 - 30 25 - 750	30 - 1800 2.1 - 124.1	Standard and Hastelloy Alloy C-276	
	D TM  77-3001	A tension loaded domed composite disk consisting of a slotted metal top section and a metal or fluorocarbon seal for low burst pressures. <i>US Patent 4819823</i>	11/16 - 44 17.5 - 1,100	3 - 2,000 0.2 - 137.89	Standard Special	
	B TM  77-2003	A tension loaded, solid metal, prebulged Rupture Disk. The forerunner of all rupture disks. First manufactured by BS&B Safety Systems, Inc. in 1931. <i>US Patent 4819823</i>	1/8 - 44 3 - 1,100	2 - 100,000 0.14 - 6,900	Standard Special	

	LOADING (DIRECTION OF FLOW)	CYCLE LIFE (RESISTANCE TO FATIGUE)	VACUUM SUPPORT REQUIRED	MAXIMUM OPERATING PRESSURE†	DESIGNED FOR NON-FRAGMENTATION	SAFETY RELIEF VALVE ISOLATION	SERVICE PHASE	MANUFACTURING RANGE	MATING SAFETY HEAD	
		Best	No	90%	Yes	Best	Gas or Liquid	10% 5% 0%		EXCELLENT
		Best	No	90%	Yes	Best	Gas ††	10% 5% 0%		
		Best	No	90%	Yes	Best	Gas ††	10% 5% 0%		
		Best	No	90%	Yes	Best	Gas or Liquid	10% 5% 0%		
		Best	No (Depending on rupture pressure)	90%	Yes	Best	Gas or Liquid	10% 5% 0%	 US Patent 4751938 EC-7RS™	EXCELLENT
		Best	No	90%	Yes	Best	Gas or Liquid	10% 5% 0%	 US Patents 5005722, 4751938 CSR-7RS™	
		Good	No	90%	Yes	Good	Gas †† or Liquid	10% 5% 0%	 RB-7R™	
		Better	No	85%	Yes	Good	Gas †† or Liquid	10% 5% 0%	 US Patent 4751938 Also NX-7R™ & NF-7RS™	
		Fair	Yes	80%	No	Not Recommended	Gas or Liquid	Full 1/2 1/4 0%		GOOD
		Average	Yes	70%	No	Not Recommended	Gas or Liquid	Full 1/2 1/4		



77-5003

NU-SAF™ PLUS SYSTEM

LCN™ A flat composite disk which opens along slots on rupture, for low burst pressures, 1"-24" (25-600mm)
XN™ A conventional forward acting domed disk which opens along score lines on rupture, 1"-12" (25-300mm)
XN-85™ A conventional forward acting domed disk which opens along score lines 1"-30" (25-750mm)
NX-7R™ - Safety Head with locating pins to ensure correct disk installation and "bite-type" seal.

GCR-S™ - 77-4014



FRS™ 77-4010

GCR-S™, GFR-S™ RUPTURE DISKS FOR SANITARY/ASEPTIC APPLICATIONS Reverse buckling disks specifically designed for pharmaceutical and biotechnology industries with low burst pressures from 10 psig (0.69 bar g) for quick and easy installation in 1" (25 mm) to 3" (80 mm) sanitary clamp fittings. Disk designed for non-fragmentation on bursting. Supplied with integral sanitary/aseptic gaskets. Maybe supplied with integral burst sensors.

FRS™ RUPTURE DISK A scored reverse buckling disk offering low burst pressures from 11.5 psig (0.79 bar g) in sizes 1" (25mm) -2" (50mm) for installation in either SRB-7RS™ or S90-7R™ Safety Head.

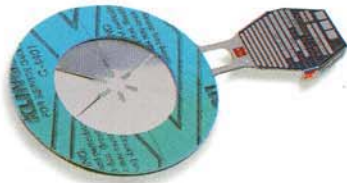
US Patents 5050630, 4576303, 5082133, worldwide patents pending (GCR-S, FRS)



77-8006

VAC-SAF™ RUPTURE DISKS A two-way acting rupture disk protects processing and storage vessels from damage caused by excessive vacuum or overpressure. Protects your vessel when excessive vacuum occurs during liquid withdrawal, accidental product loss or during steam cleaning and sterilization. The type DKB™ rupture disk and KB-7R™ Safety Head assembly are available for installation between standard pipe flanges. The type VKB™ rupture disk and KB-C™ Safety Head are uniquely designed with sanitary fittings. Burst pressures from inches WC. Sizes from 2" (50mm) to 8" (200mm)

US Patent 4657157, worldwide patents pending



77-8001

AV™ TYPE RUPTURE DISK A flat composite disk with gaskets is installed directly between flanges (no disk holder required). The low pressure AV™ Disk may be used for the protection of atmospheric vessels and for isolating relief valves from downstream contamination.

Standard sizes 2" (50mm) to 36" (900mm)



77-7005

THREADED AND WELDED ASSEMBLIES A wide range of standard and custom designed rupture disk assemblies for your specific application. Assemblies are designed to be discarded after disk rupture; other designs permit the replacement of the ruptured disk. Customized designs are available for customer applications which cannot be met using standard assembly designs. Sizes from 1/8" - 6" (3-150mm) and burst pressures from 10 psig (0.69 bar g) to 100,000 psig (6900 bar g). Disk assemblies include soldered, welded, crimped, threaded designs.

US Patents 4576303, 4553559, 5082133

VENT-SAF® 77-8003

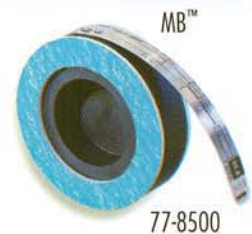


VENT-SAF® PLUS 77-8015



VENT-SAF® AND VENT-SAF® PLUS EXPLOSION PANELS BS&B Safety Systems, Inc., has designed the Vent-Saf® and Vent-Saf® Plus Explosion Panels to protect equipment against damage in the event of deflagrations of combustible materials. Explosion Panels are low burst pressure membranes which are designed to be fastened over an opening of calculated size to provide rapid pressure relief. BS&B utilizes NFPA 68 and VDI-3673 Venting Guidelines, which are recognized worldwide.

↳ VENT-SAF® PLUS revolutionary one piece, domed metal explosion vent. US Patent 5036632



77-8500



REV

77-8550

SAF-T-GRAF® MONOBLOC AND REPLACEABLE ELEMENT GRAPHITE DISKS Graphite disks are made from impregnated graphite offering low burst pressures and excellent corrosion resistance. The Monobloc range is supplied with integral gaskets for direct installation between international pipe flanges. The Replaceable Element range is installed in graphite or stainless steel Safety Heads before installation between pipe flanges sizes 0.5" (15mm) - 24" (600mm) in burst pressures 0.25 psig (0.02 bar g) - 1,000 psig (69 bar g) at temperatures to 205°C (400°F). Higher operating temperatures to 427°C (800°F) are achieved using a High Temperature Assembly. A steel Amoring ring around the disk for added safety and easier installation is recommended.

US Patent 5121847



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† Maximum operating pressure is a recommended value expressed as a percentage of marked burst pressure (Assuming a ± 5% burst tolerance.)

RECOMMENDED MAXIMUM TEMPERATURES:

Aluminum	250°F 121°C	Monel Alloy 400	800°F 427°C	316SS	900°F 482°C
PTFE	500°F 260°C	FEP	400°F 204°C	Hastelloy Alloy C-276	900°F 482°C
Nickel Alloy 200	750°F 399°C	Inconel Alloy 600	1100°F 593°C	Tantalum	500°F 260°C
		Titanium	572°F 300°C		

* Standard Materials: Aluminum, Nickel Alloy 200, Inconel Alloy 600, Monel Alloy 400, 316 SS, Hastelloy Alloy C-276.
 Special Materials: Tantalum, Titanium, Hastelloy Alloy C-22.

†† May be used in liquid service provided there is an adequate volume of vapor/gas above the liquid and below the disk.
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