



FRB™ Frustum Reverse Buckling Rupture Disk

The FRB rupture disk combines small nominal size and low burst pressure in a solid metal reverse buckling disk design that permits the most efficient compact assembly design. Millions of FRB disks are in service on aircraft safety systems, aerospace equipment, automotive systems, and thousands of OEM applications.



Note: Most FRB disks are supplied as an assembly, often with screw threaded connections

Features

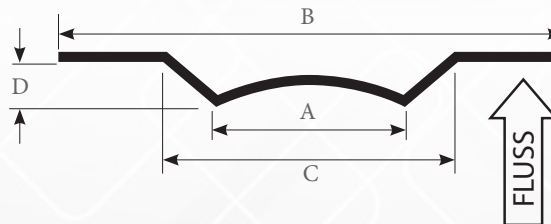
- Standard sizes: 1/8, 1/4, 3/8, 1/2, and 3/4 inch (3, 6, 9, 12 and 19 mm)
- Pressure ratings from 20 to 900 psig (1.4 to 62 barg)
- Full opening along circular score
- Solid metal, reverse buckling technology
- Standard materials: 316ss, nickel 200, Inconel® 600 and aluminum

Typical Applications

- High-energy lithium batteries
- Fire protection equipment
- Industrial gas equipment
- Refrigeration systems
- Aerospace energy systems
- Cryogenic systems

Disk Dimensions

To assist with the design of a rupture disk assembly containing an FRB disk, consider the standard dimensions in the table below as guidance. The core dimensions of the FRB disk are A, C, and D while the outside diameter (B) can be easily changed to suit specific application conditions. BS&B supply FRB disks in assemblies that combine the FRB disk and appropriate holder arrangement, except for high volume applications where an FRB disk may be supplied alone which requires careful development of installation details between BS&B and the customer.



Benefits

- Designed for non-fragmentation
- Accurate and reliable burst ratings
- Superior performance in cycling service
- Full opening in either gas or liquid service
- Withstands full vacuum
- Can operate up to 85% of rated burst pressure
- Standard and custom holder designs are available
- Low volume, starting at one unit
- High volume, automated manufacturing

FRB Disk Maximum Recommended Operating Temperatures

Metal	°F	°C
Nickel 200	750	399
Inconel® 600	900	482
316ss	900	482
Aluminum	250	121

Inconel® is a trademark of Special Metal Corporation

Nominal Size	A		B		C		D		
	Flow Diameter		Outside Diameter Options		Dome Diameter		Maximum Height		
in	mm	in	mm	in	mm	in	mm	in	mm
1/8	3	0.125	3.175	0.312	7.925	0.185	4.699	0.040	1.016
1/4	6	0.215	5.461	0.500, 0.550	12.700, 13.970	0.315	8.001	0.050	1.270
3/8	9	0.350	8.890	0.670, 0.750, 0.935, 1.000	17.018, 19.05, 23.749, 25.400	0.500	12.700	0.070	1.778
1/2	12	0.525	13.335	0.935, 1.000	23.749, 25.400	0.750	19.050	0.090	2.286
3/4	19	0.787	19.990	1.181	29.997	0.984	24.994	0.125	3.175

These dimensions are for information only, exact FRB disk installation design shall be determined by BS&B for each application.

FRB Disk Burst Pressure Capabilities

Pressure ratings at 72°F (22°C) for gas or vapor service

Disk Size		Disk Material*															
		Nickel 200				Inconel® 600				316ss				Aluminum			
		min		max		min		max		min		max		min		max	
in	mm	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg
1/8	3	200	13.79	500	34.47	250	17.24	850	58.61	300	20.68	900	62.05	125	8.62	400	27.58
1/4	6	100	6.89	450	31.03	150	10.34	800	55.16	150	10.34	850	58.61	60	4.14	300	20.68
3/8	9	50	3.45	400	27.58	60	4.14	750	51.71	60	4.14	800	55.16	35	2.41	250	17.24
1/2	13	35	2.41	200	13.79	45	3.10	650	44.82	45	3.10	675	46.54	25	1.72	200	13.79
3/4	19	30	2.07	120	8.27	35	2.41	390	26.89	40	2.76	405	27.92	20	1.38	120	8.27

Pressure ratings at 72°F (22°C) for liquid service

Disk Size		Disk material*															
		Nickel 200				Inconel® 600				316ss				Aluminum			
		min		max		min		max		min		max		min		max	
in	mm	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg
1/8	3	Consult factory															
1/4	6	250	17.24	450	31.03	250	17.24	800	55.16	250	17.24	850	58.61	60	4.14	300	20.68
3/8	9	150	10.34	400	27.58	150	10.34	750	51.71	150	10.34	800	55.16	35	2.41	250	17.24
1/2	13	80	5.52	200	13.79	80	5.52	650	44.82	80	5.52	675	46.54	25	1.72	200	13.79
3/4	19	Consult factory															

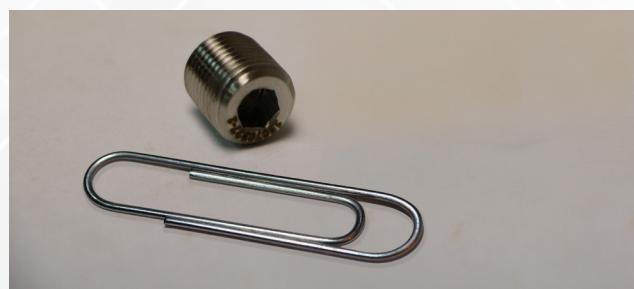
Miniaturized Reverse Buckling Disk Assemblies

As equipment manufacturers strive to make their products smaller, lighter, with higher technical performance and value to the end user, BS&B has met the challenge with the combined capabilities of the FRB, QRB and MRB rupture disks. In the past, rupture disk technology limitations encouraged equipment designers to consider small relief valve devices while a good rupture disk device design would offer superior leak tightness, flow characteristics, and vibration stability, along with low mass and a compact shape.

BS&B focused R&D attention to miniaturizing the most advanced rupture disk designs that have long benefited the chemical process industry. Harnessing the use of shapes and structures to resist normal operating pressure and temperature conditions, the FRB, QRB and MRB rupture disks respond by opening with millisecond speed at the desired burst pressure providing the equipment designer with 'reverse buckling' disk superior performance.



1/8 in (3mm) nominal size FRB disk adjacent to a standard sized paper clip.



1/8 in (3mm) nominal size welded FRB assembly adjacent to a standard sized paper clip.

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