

# SKR-U<sup>TM</sup> Rupture Disk

SKR-U Rupture Disk Partnered with a Threaded Union-Type Holder



# SK<sub>R</sub>-U™ Rupture Disk for Threaded Union Fitting Service

The SK<sub>R</sub>-U rupture disk is partnered with the UR-2™ safety head to provide high integrity reverse buckling rupture disk technology in a threaded union type holder. The SK<sub>R</sub>-U rupture disk uses Saf™ technology (structural apex forming) to accurately control its burst pressure making it insensitive to the assembly torque variations that will occur in a threaded type holder.

## Features

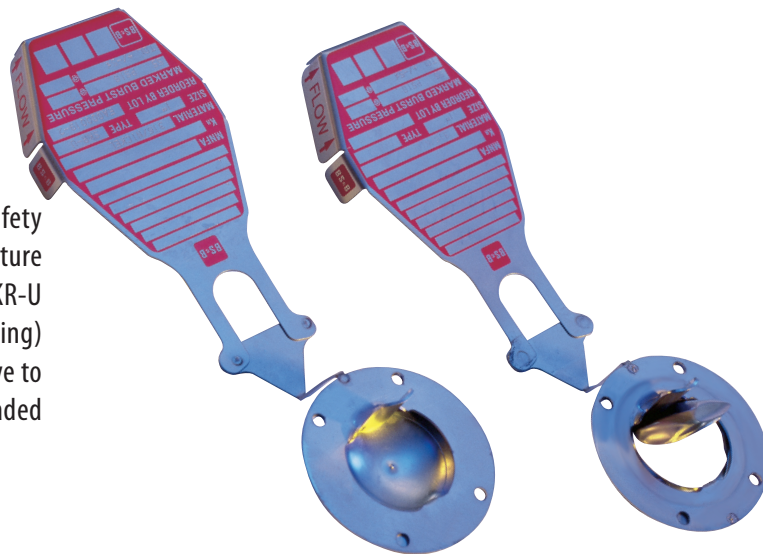
- Standard sizes 1/2, 3/4 and 1 inch (15, 20 and 25mm)
- +/-5% accuracy of burst pressure in a union type safety head
- Gas or liquid service compatibility
- Low KR values (flow resistance factors)
- Long service life in pressure cycling or pulsating conditions
- Maximum operating ratio is 90% and 95% of the minimum burst pressure
- Fail-Safe™ design - damage safety ratio < 1
- Designed for non-fragmentation
- Withstands full vacuum
- Info-tag, 3-dimensional tag indicates correct orientation and code / standard requirements
- For use with BS&B type UR-2 safety head
- US patents 6178983, 6321582, 6446653, 6494074 and international patents apply
- Standard manufacturing design range is 0%, optional -5% and -10%MDR

## Materials and Set Pressures

Minimum/Maximum Pressure Rating at 72°F (22°C)

Rupture disk materials	Burst pressure			
	Minimum		Maximum	
	psig	barg	psig	barg
Nickel (alloy 200)	55	4	500	35
316ss	60	4	500	35
Inconel® (alloy 600)	60	4	500	35
Hastelloy® C-276 (alloy 276)	60	4	500	35
Tantalum	55	4	500	35
Monel® (alloy 400)	60	4	500	35
Titanium	90	6	500	35

*Note: Hastelloy® is a trademark of Haynes International Inc. Monel® and Inconel® are registered trademarks of Special Metals Corporation and its subsidiaries.*



The SK<sub>R</sub>-U is a two-part rupture disk comprising a calibrated metal dome that faces into and responds to a source of overpressure, and a stainless steel hinge ring permanently fitted to the downstream side of the disk that works together with the safety head to retain the disk petal after opening. These pressures are applicable to all sizes of SK<sub>R</sub>-U rupture disk: 1/2, 3/4 and 1 inch. Standard safety head material is 316 stainless steel.

## Thread Connection Options

The standard thread connections are 1/2, 3/4 and 1 inch NPT female inlet and outlet, alternatives are available by special request.

*Note: SK<sub>R</sub>-U disks are specified at 1/2, 3/4 or 1 inch to match the holder connection.*

## Liners

Fluoropolymer Liners are available in all sizes as optional on the process side of the disk.

### Temperature Range

FEP -40°F to 400°F (-40°C to 205°C)

PTFE -40°F to 500°F (-40°C to 260°C)

## Burst Tolerance

Marked Burst Pressure	Burst Tolerance
≤ 40 psig (2.76barg)	± 2 psig (0.138barg)
> 40 psig (2.76 barg)	± 5%

## Minimum Net Flow Area (MNFA), Net Flow Area (NRA)

Unit Size	in		mm		in		mm	
	1/2	15	3/4	20	1	25		
MNFA (in <sup>2</sup> )	0.304		0.533		0.608			
NRA (cm <sup>2</sup> )	1.96		3.43		3.92			

## Manufacturing Design Range (MDR) Choices for SKR-U Rupture Disks

**MDR= 0:** where the user requires the tightest margin between normal service pressure and burst pressure, a zero range disk shall be used.

**MDR= -5%:** applied to the requested burst pressure, a -5% range allows an additional 5% tolerance applied on the minus side of the user requested burst pressure.

**MDR= -10%:** applied to the requested burst pressure, a -10% range allows an additional 10% tolerance applied on the minus side of the user requested burst pressure.

*Note: MDR and burst tolerance are additive. In the European/ISO case, the burst tolerance and MDR are simply combined. In the ASME case, the 'marked burst pressure' for a lot of rupture disks must be a value within the agreed MDR and then the burst tolerance is applied. When deciding set pressure specifications:*

1. Decide between ASME/North American (with or without 'UD' stamp) and European (with or without 'CE' mark)/ISO standards.
2. Select the MDR appropriate to the application and check that it is available for the disk type selected. (0, -5 or -10%).

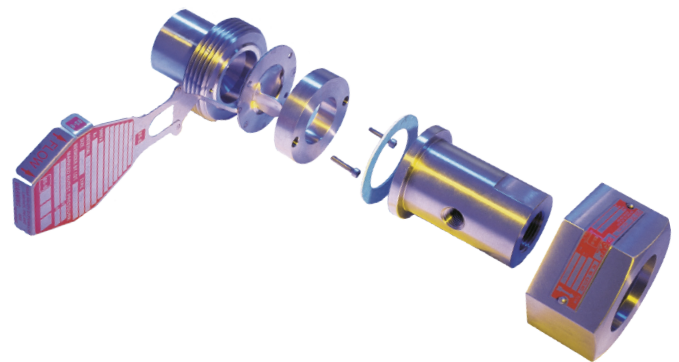
## UR-2™ Safety Head

The UR-2 safety head contains 4 metal components: the inlet, the holdown ring, the outlet and the hexagon assembly nut. The SKR-U rupture disk is pre-assembled to the safety head between the inlet and the holdown ring using two capscrews. This locates and centers the disk, ensuring the correct direction of installation: these two capscrews and a single locating pin in the UR-2 inlet have an asymmetric layout that matches three holes in the SKR-U disk flange.

The pre-assembly feature ensures that the disk can be easily installed even where the piping flow path may not be 'vertical up'. The inlet / disk / holdown subassembly is fixed to the UR-2 threaded outlet by the hexagon nut. It is the hexagon nut that provides the sealing load to the safety head assembly (the capscrews are for preassembly only).

As an option, the UR-2 safety head can be provided with a threaded connection on the outlet side to enable the connection of a 'tell-tale' assembly. This will enable monitoring of pressure downstream of the SKR-U rupture disk, or installation of an excess flow valve to ensure downstream pressure is at atmospheric conditions. One of these measures is required by codes and standards when a rupture disk is installed upstream of a pressure relief valve.

The design temperature for the UR-2 union safety head is 700°F (371°C). All of the standard holder and rupture disk materials are available up to this limit except for titanium and tantalum. Titanium is limited to 572°F (300°C) and tantalum is limited to 500°F (260°C).



## Torque Drive Adapter

Accurate torque control on a large hexagon can be difficult. BS&B Safety Systems can provide a Torque Drive Adapter for use with all UR-2 Safety Heads (one adapter for all sizes). This adapter permits the use of a standard torque wrench for control of installation load through tightening of the external hexagon nut. The torque drive adapter is available as an accessory.

## Sealing

The SKR-U Safety Head incorporates a 'bite-type' seal. This concentrates the holder assembly load to cut an impression in the SKR-U Rupture Disk flange that ensures a leak tight installation. A gasket (compressed non asbestos fiber) is placed inside the UR-2 Safety Head between the holder outlet and the disk holdown ring to ensure a good seal on the downstream side of the installation after assembly of the holder. This gasket is supplied with each SKR-U Rupture Disk, and should be replaced with each new disk.

## Pressure Rating of Holder

The design pressure of the UR-2 holder is 1,000 psi/68.95 Bar. This exceeds the 500 psi/34.47 Bar maximum burst pressure of the SKR-U Rupture Disk.



## AMERICAS

### Tulsa, OK USA

T: +1 918 622 5950  
F: +1 918 665 3904  
E: sales@bsbsystems.com

### Houston, TX USA

T: +1 713 682 4515  
F: +1 713 682 5992  
E: sales@bsbsystems.com

### Minneapolis, MN USA

T: +1 952 941 0146  
F: +1 952 941 0646  
E: sales@bsbipd.com

### Edmonton, AB Canada

T: +1 780 955 2888  
F: +1 780 955 3975  
E: contacts@bsbprocess.com

### Monterrey, Mexico

T: +011 52 81 8299 5861  
F: +011 52 81 8299 5862  
E: sales@bsbsystems.com

### Sao Paulo, Brasil

T: +55 11 2084 4800  
F: +55 11 2021 3801  
E: sales@bsbbrasil.com

## EUROPE, MIDDLE EAST & AFRICA

### Limerick, Ireland

T: +353 61 484700  
F: +353 61 304774  
E: sales@bsb.ie

### Düsseldorf, Germany

T: +49 211 930550  
F: +49 211 3982171  
E: info@bormann-neupertbsb.de

### Manchester, UK

T: +44 161 955 4202  
F: +44 161 870 1086  
E: sales@bsb-systems.co.uk

### Moscow, Russia

T: +7 495 747 5916 ext. 427  
F: +7 499 133 4394  
E: sales@bsbsystems.ru

### The Hague, The Netherlands

T: +31 20 399 9965  
E: info@bsbsystems.nl

### Copenhagen, Denmark

T: +45 29 65 69 61  
E: info@bsbsystems.dk

### United Arab Emirates

T: +971 (0) 55 518 0314  
T: +971 (0) 55 518 0916  
F: +971 (0) 2 558 9961  
E: sales@bsbsystems.ae

## ASIA PACIFIC

### Singapore

T: +65 6513 9780  
F: +65 6484 3711  
E: sales@bsb.com.sg

### Yokohama, Japan

T: +81 45 450 1271  
F: +81 45 451 3061  
E: information@bsb-systems.co.jp

### Seoul, South Korea

T: +82 2 2636 9110  
F: +82 2 2636 9120  
E: sales@bsbsystems.kr

### Shanghai, China

T: +86 21 6391 2299  
F: +86 21 6391 2117  
E: sales@bsbsystems.com

### Chennai, India

T: +91 44 2450 4200  
F: +91 44 2450 1056  
E: sales@bsbsystems.com



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