

**ZOOK®**



## Graphite Rupture Disks



**Safety** through **knowledge** and **performance**.

ZOOK is the first and largest company in the world committed to manufacturing quality impervious graphite rupture disks, through product innovations and superior service. ZOOK is the first graphite rupture disk manufacturer to earn the ASME Code UD symbol stamp and certificate of authorization. ZOOK is certified in accordance with the Pressure Equipment Directive (PED 2014/68/EU) and can provide CE marked graphite rupture disks. ZOOK has been certified to AS9100D:2016 (ISO9001:2015), meaning that our Quality Management System at our graphite manufacturing facility has been certified to the Aviation, Aerospace and Defense industry compliance standards. The AS9100 Standard includes the ISO9001 standard as its foundation, but is much more stringent in its requirements.

ZOOK graphite rupture disks protect capital equipment and personnel from the effects of overpressurization in static and dynamic pressurized systems. The disk is designed to rupture at a predetermined burst rating when installed. Each disk is made from a single piece of graphite, a high-purity form of carbon, which is resin impregnated. The resulting material, called impervious graphite, is impermeable and is resistant to most corrosives.

ZOOK offers RAPID delivery of many common sizes and pressure ratings. Our service personnel are also available 24 hours-a-day, 7 days-a-week to handle your emergency shut-down needs. We produce a standard line of graphite disks as small as 1/2" (15 mm) diameter and disks with burst ratings as low as 0.25 psig (0.02 barg). To verify graphite performance, ZOOK tests all disks at coincident temperatures.

### **Our graphite rupture disks:**

- Are easy to install and maintenance-free
- Are tamperproof
- Have no springs or moving parts
- Mount directly between standard flanges

Options and accessories are also available to increase the flexibility of standard graphite disks. Mounting sensors, special gaskets and stainless steel armor are also available. Spacer rings let you replace metal rupture disks without requiring piping modification.

## **Applications**

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ZOOK graphite disks enhance SAFETY in chemical, petrochemical, pharmaceutical, food, medical, and related processing systems around the world. Other applications include: storage tanks, tank trailers, rail cars, barges, pressurized switchgear, and air conditioning compressors.

### **Graphite disks also increase system efficiency by:**

- Eliminating back pressure effects on overpressure devices in common vent lines
- Solving sourcing and cost problems for disks used with highly corrosive fluids
- Offering ultra low rated pressure settings

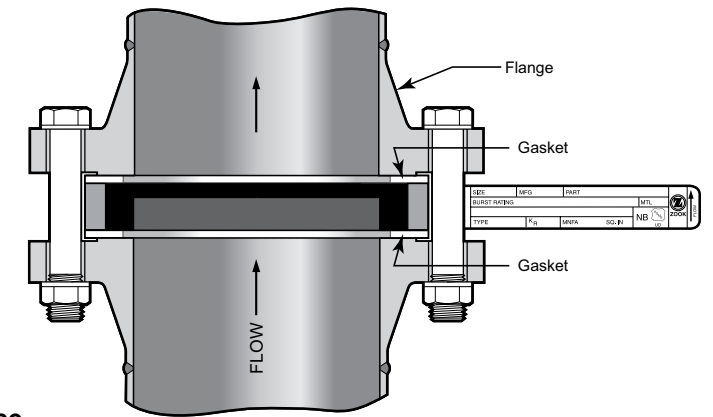
## **ZOOK Differentiator**

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For ultimate chemical resistance and enhanced temperature range, choose FDA compliant FS Sintered disks exclusive only to ZOOK. (see page 8)

## Features

- The best choice for low and intermediate burst ratings
- Available in nominal sizes 1/2" (15 mm) thru 24" (600 mm) diameters
- Designed to fit industry standard flanges ASME B16.5, ISO and JIS
- Burst ratings 0.25 psig (0.02 barg) to 150 psig (10.34 barg)
- 0% manufacturing range
- Operating pressures to 90% of the disk's marked burst pressure. Contact ZOOK for operating ratio for burst pressures below 40 psig (2.76 barg)
- Temperature ratings -290°F to +700°F (-179°C to +371°C). Maximum temperature rating without insulation is 430°F (221°C) or 700°F (371°C) with insulation. Contact ZOOK for higher temperature ratings. The specified temperature shall be at the disk location at the time when the disk is expected to rupture
- Counterbore side of the disk contacts the process media
- Vacuum supports are available for ratings below 25 psig (1.72 barg)
- May be configured to withstand high back pressure generated in closed piping systems
- Many standard Mono disks in common sizes and pressure ratings are available for RAPID Delivery. Contact ZOOK for more information  
 Sizes in (mm): 1" (25), 1-1/2" (40), 2" (50), 3" (80), 4" (100), 6" (150), 8" (200) to fit ASME B16.5 Class 150 flanges  
 Burst Pressures psig (barg): 10 (0.69), 15 (1.03), 20 (1.38), 25 (1.72), 30 (2.07), 40 (2.76), 50 (3.45), 75 (5.17), 100 (6.89), 125 (8.62), 150 (10.34)  
**Note:** RAPID Delivery Mono disks are supplied with adhesive tags
- ASME (UD) and PED (CE) compliance available



Required Vacuum Support Style for Full Vacuum Service

Disk Size / Range		Burst Pressure Range		Vacuum Support Style			
				Ring	Bar	Cross	Plate
1	25	<25	<1.72	X	-	-	-
1-1/2	38	<25	<1.72	-	X	-	-
2 thru 14	50 thru 356	9 to 25	0.62 to 1.72	-	X	-	-
		5 to <9	0.34 to <0.62	-	-	X	-
		<5	<0.34	-	-	-	X

Certified Flow Resistance Factor (Krgl)

Support Style	Krgl
Mono – no support	0.26
Mono – with bar	2.40
Mono – with cross	5.40
Mono – with ring	6.44
Mono – with plate	15.70

## Specifications

Disk Size				MNFA										Thickness*				Outside Diameter																Burst Ratings						
NPS	DN	Actual ID		Full Bore		Vacuum Support Style				ASME CI 150 PN6 / 10 / 16 / 20 JIS 5K / 10K / 16K		ASME B16.5 Class		DIN & ISO				ISO ONLY		JIS				Min Pressure (All Flanges)		Max Pressure (Flange Group 1)														
		in	mm	in	mm	Ring	Bar	Cross	Plate	Standard Disk	Insulated Unit	150	PN6	PN10	PN16	PN20	5K	10K	16K	20K																				
in	mm	mm	in	mm	in <sup>2</sup>	mm <sup>2</sup>	in <sup>2</sup>	mm <sup>2</sup>	in <sup>2</sup>	mm <sup>2</sup>	in <sup>2</sup>	mm <sup>2</sup>	in <sup>2</sup>	mm <sup>2</sup>	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	psig	barg	psig	barg				
1/2	13	15	0.62	15.7	0.30	193	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.63	15.8	1.75	44.4	1.75	44.4	1.73	43.9	2.01	51.0	2.01	51.0	1.75	44.4	1.89	48.0	2.17	55.1	2.17	55.1	2.17	55.1	25.00	1.72	150.00	10.34
3/4	19	20	0.82	20.8	0.53	341	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.63	15.8	1.75	44.4	2.13	53.9	2.13	54.1	2.40	60.9	2.40	60.9	2.13	54.1	2.09	53.0	2.36	59.9	2.36	59.9	2.36	59.9	25.00	1.72	150.00	10.34
1	25	25	1	25.4	0.78	503	0.44	283	0.60	387	0.47	303	0.32	206	0.88	22.2	2.25	57.1	2.50	63.5	2.52	64.0	2.80	71.1	2.80	71.1	2.50	63.5	2.48	62.9	2.80	71.1	2.80	71.1	2.80	71.1	10.00	0.69	150.00	10.34
1-1/2	38	40	1.50	38.1	1.76	1,135	N/A	N/A	1.34	864	1.05	677	0.72	464	0.88	22.2	2.25	57.1	3.25	82.5	3.39	86.1	3.62	91.9	3.62	91.9	3.25	82.5	3.15	80.0	3.39	86.1	3.39	86.1	3.39	86.1	7.00	0.48	150.00	10.34
2	50	50	2	50.8	3.14	2,025	N/A	N/A	2.39	1,541	1.86	1,200	1.30	838	0.88	22.2	2.25	57.1	4.00	101.6	3.78	96.0	4.21	106.9	4.21	106.9	4.00	101.6	3.54	89.9	3.98	101.0	3.98	101.0	3.98	101.0	3.00	0.21	150.00	10.34
2-1/2	64	65	2.50	63.5	4.78	3,083	N/A	N/A	3.65	2,354	2.94	1,896	2.04	1,316	0.88	22.2	2.25	57.1	4.75	120.6	4.59	116.5	5.00	127.0	5.00	127.0	4.75	120.6	4.52	114.8	4.76	120.9	4.76	120.9	4.76	120.9	3.00	0.21	125.00	8.62
3	76	80	3	76.2	7.06	4,554	N/A	N/A	5.56	3,587	4.31	2,780	2.95	1,903	0.88	22.2	2.25	57.1	5.25	133.3	5.20	132.0	5.59	141.9	5.59	141.9	5.25	133.3	4.96	125.9	5.16	131.0	5.39	136.9	5.39	136.9	2.00	0.14	100.00	6.89
4	102	100	4	101.6	12.56	8,103	N/A	N/A	10.56	6,812	8.81	5,683	5.47	3,529	0.88	22.2	2.25	57.1	6.75	171.4	5.98	151.8	6.38	162.0	6.38	162.0	6.75	171.4	5.75	146.0	6.14	155.9	6.38	162.0	6.38	162.0	1.50	0.10	100.00	6.89
5	127	125	5	127.0	19.63	12,664	N/A	N/A	15.88	10,245	12.70	8,193	8.39	5,412	0.88	22.2	2.25	57.1	7.75	196.8	7.16	181.8	7.55	191.7	7.55	191.7	7.75	196.8	7.12	180.8	7.36	186.9	7.87	199.9	7.87	199.9	1.50	0.10	100.00	6.89
6	152	150	6	152.4	28.27	18,238	N/A	N/A	22.27	14,367	17.27	11,141	12.05	7,774	0.88	22.2	2.25	57.1	8.63	219.0	8.15	207.0	8.58	217.9	8.58	217.9	8.63	219.2	8.31	211.0	8.54	216.9	9.25	234.9	9.25	234.9	1.00	0.07	75.00	5.17
8	203	200	8	203.2	50.02	32,270	N/A	N/A	40.26	25,974	31.82	20,528	21.14	13,638	1.13	28.5	2.75	69.8	10.88	276.2	10.31	261.8	10.75	273.0	10.75	273.0	10.88	276.3	10.12	257.0	10.51	266.9	11.20	284.4	11.20	284.4	0.50	0.03	75.00	5.17
10	254	250	10	254.0	78.53	50,664	N/A	N/A	63.53	40,987	50.78	32,761	32.66	21,070	1.50	38.1	3.38	85.8	13.25	336.5	12.48	316.9	12.91	327.9	12.95	328.9	N/A	N/A	12.68	322.0	12.99	329.9	13.90	353.0	N/A	N/A	0.25	0.02	75.00	5.17
12	305	300	12	304.8	113.09	72,961	N/A	N/A	89.09	57,477	69.09	44,574	47.24	30,477	2.00	50.8	4.38	111.2	16.00	406.4	14.69	373.1	14.88	377.9	15.12	384.0	N/A	N/A	14.45	367.0	14.76	374.9	15.87	403.1	N/A	N/A	0.25	0.02	50.00	3.45
14	356	350	13.25	336.5	137.88	88,954	N/A	N/A	108.06	69,715	83.31	53,748	58.07	37,464	2.25	57.1	4.88	123.9	17.63	447.6	16.65	422.9	17.24	437.9	17.48	443.9	N/A	N/A	16.14	409.9	16.54	420.1	17.60	447.0	N/A	N/A	0.25	0.02	50.00	3.45
16	406	400	15.25	387.3	182.65	117,838	N/A	N/A	144.52	93,238	112.65	72,677	84.49	54,509	2.50	63.5	5.38	136.6	20.13	511.1	18.62	472.9	19.25	488.9	19.49	495.0	N/A	N/A	18.50	469.9	19.02	483.1	19.96	506.9	N/A	N/A	0.25	0.02	50.00	3.45
18	457	450	17.25	438.1	233.70	150,773	N/A	N/A	181.95	117,386	153.70	99,161	104.31	67,296	2.75	69.8	5.88	149.3	21.50	546.1	20.79	528.0	21.22	538.9	21.85	554.9	N/A	N/A	20.87	530.1	21.81	553.9	22.52	572.0	N/A	N/A	0.25	0.02	50.00	3.45
20	508	500	19.25	488.9	291.03	187,760	N/A	N/A	233.28	150,502	184.53	119,051	122.49	79,025	3.00	76.2	6.38	162.0	23.75	603.2	22.76	578.1	23.39	594.1	24.29	616.9	N/A	N/A	22.83	579.8	23.35	593.0	24.69	627.1	N/A	N/A	0.25	0.02	40.00	2.76
24	610	600	23.25	590.5	424.55	273,902	N/A	N/A	354.80	228,902	294.05	189,709	190.61	122,973	3.00	76.2	6.38	162.0	28.13	587.3	26.73	678.9	27.36	694.9	28.90	734.0	N/A	N/A	27.09	688.0	27.44	696.9	28.78	731.0	N/A	N/A	0.25	0.02	25.00	1.72

**Notes:**  
 \*Standard disk thickness does not include gaskets. Insulated unit thickness includes all gaskets  
 • Disks w/pressure ratings of 25 psig (1.72 barg) and above will support full vacuum w/o additional support  
 • Maximum pressure rating of ASME B16.5 Class 150 flanges is 290 psig (19.99 barg) @ 100°F (38°C). The maximum pressure rating is lower at higher temperatures. Reference ASME/ANSI B16.5  
 • All pressures shown are based on an ambient temperature of 72°F (22°C)  
 • Not all minimum/maximum pressure and temperature combinations are available. Please contact ZOOK for more information  
 • Unless otherwise noted, stated MNFA and Kr values apply to the rupture disk only and does not include the addition of external vacuum supports or insulated units



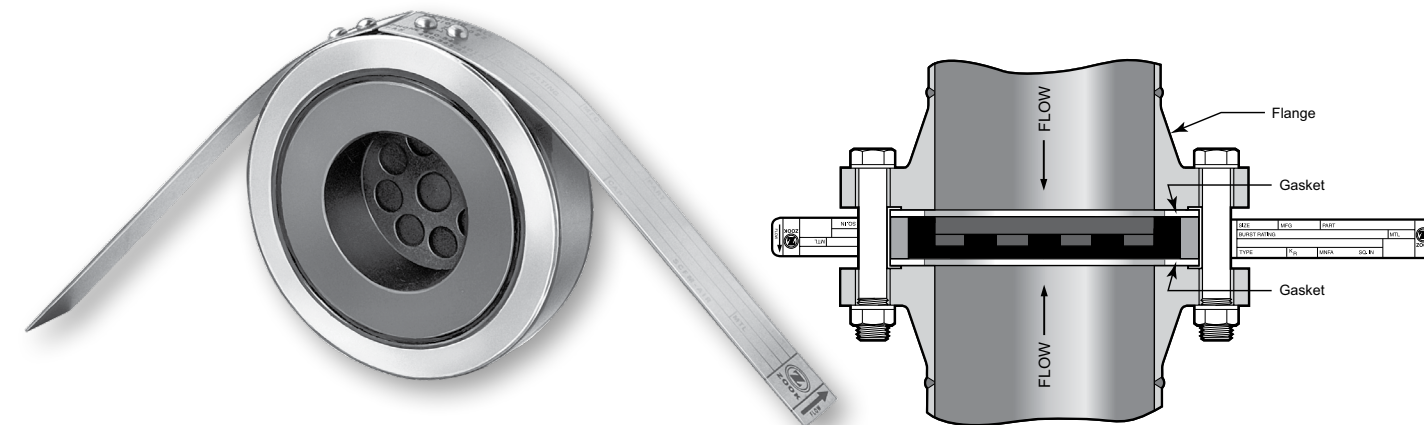






## Features

- Dual rated to protect against two different pressures in opposite directions
- Applications include protection of storage tanks against both excess vacuum and overpressure when single vessel entry is required
- Available in nominal sizes 1-1/2" (40 mm) thru 24" (600 mm) diameters
- Designed to fit industry standard flanges ASME B16.5, ISO and JIS
- Burst ratings 0.25 psig (0.02 barg) to 1000 psig (68.95 barg) or higher
- 0% manufacturing range
- Operating pressures to 90% of the disk's marked burst pressure. Contact ZOOK for operating ratio for burst pressures below 40 psig (2.76 barg)
- Temperature ratings -290°F to +430°F (-179°C to +221°C). Contact ZOOK for higher temperature ratings. The specified temperature shall be at the disk location at the time when the disk is expected to rupture
- Carbon steel armor standard, 316SS optional
- Furnished complete with PTFE gaskets attached. Other gasket materials are available
- Generally a minimum differential of 10 psi is required between burst ratings. Contact ZOOK for other burst rating combinations
- PED (CE) compliance available



## Specifications

Disk Size					Thickness*		Outside Diameter																Burst Ratings							
NPS	DN	Actual ID		(Flange Group 1)		ASME B16.5 Class		DIN & ISO				ISO ONLY		JIS				Low Pressure Direction		High Pressure Direction										
				ASME CI 150 PN6 / 10 / 16 / 20 JIS 5K / 10K / 16K		150		PN6		PN10		PN16		PN20		5K		10K		16K		20K		Min	Max	Min	Max			
in	mm	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	psig	barg			psig	barg
1-1/2	38	40	1.5	38	1.13	28.7	3.25	82.5	3.39	86.1	3.62	91.9	3.62	91.9	3.25	82.5	3.15	80.0	3.39	86.1	3.39	86.1	3.39	86.1	7.00	0.48	Full Vacuum	▲	150.00	10.34
2	50	50	2	51	1.13	28.7	4.00	101.6	3.78	96.0	4.21	106.9	4.21	106.9	4.00	101.6	3.54	89.9	3.98	101.0	3.98	101.0	3.98	101.0	3.00	0.21	Full Vacuum	▲	150.00	10.34
2-1/2	64	65	2.5	64	1.13	28.7	4.75	120.6	4.59	116.5	5.00	127.0	5.00	127.0	4.75	120.6	4.52	114.8	4.76	120.9	4.76	120.9	4.76	120.9	3.00	0.21	Full Vacuum	▲	125.00	8.62
3	76	80	3	76	1.13	28.7	5.25	133.3	5.20	132.0	5.59	141.9	5.59	141.9	5.25	133.3	4.96	125.9	5.16	131.0	5.39	136.9	5.39	136.9	2.00	0.14	Full Vacuum	▲	100.00	6.89
4	102	100	4	102	1.13	28.7	6.75	171.4	5.98	151.8	6.38	162.0	6.38	162.0	6.75	171.4	5.75	146.0	6.14	155.9	6.38	162.0	6.38	162.0	1.50	0.10	Full Vacuum	▲	100.00	6.89
5	127	125	5	127	1.13	28.7	7.75	196.8	7.16	181.8	7.55	191.7	7.55	191.7	7.75	196.8	7.12	180.8	7.36	186.9	7.87	199.9	7.87	199.9	1.50	0.10	Full Vacuum	▲	100.00	6.89
6	152	150	6	152	1.13	28.7	8.63	219.2	8.15	207.0	8.58	217.9	8.58	217.9	8.63	219.2	8.31	211.0	8.54	216.9	9.25	234.9	9.25	234.9	1.00	0.07	Full Vacuum	▲	100.00	6.89
8	203	200	8	203	1.38	35.0	10.88	276.3	10.31	261.8	10.75	273.0	10.75	273.0	10.88	276.3	10.12	257.0	10.51	266.9	11.20	284.4	11.20	284.4	0.50	0.03	Full Vacuum	▲	100.00	6.89
10	254	250	10	254	1.78	45.2	13.25	336.5	12.48	316.9	12.91	327.9	12.95	328.9	13.25	336.5	12.68	322.0	12.99	329.9	13.90	353.0	-	-	0.25	0.02	Full Vacuum	▲	100.00	6.89
12	305	300	12	305	2.25	57.1	16.00	406.4	14.69	373.1	14.88	377.9	15.12	384.0	16.00	406.4	14.45	367.0	14.76	374.9	15.87	403.1	-	-	0.25	0.02	Full Vacuum	▲	75.00	5.17

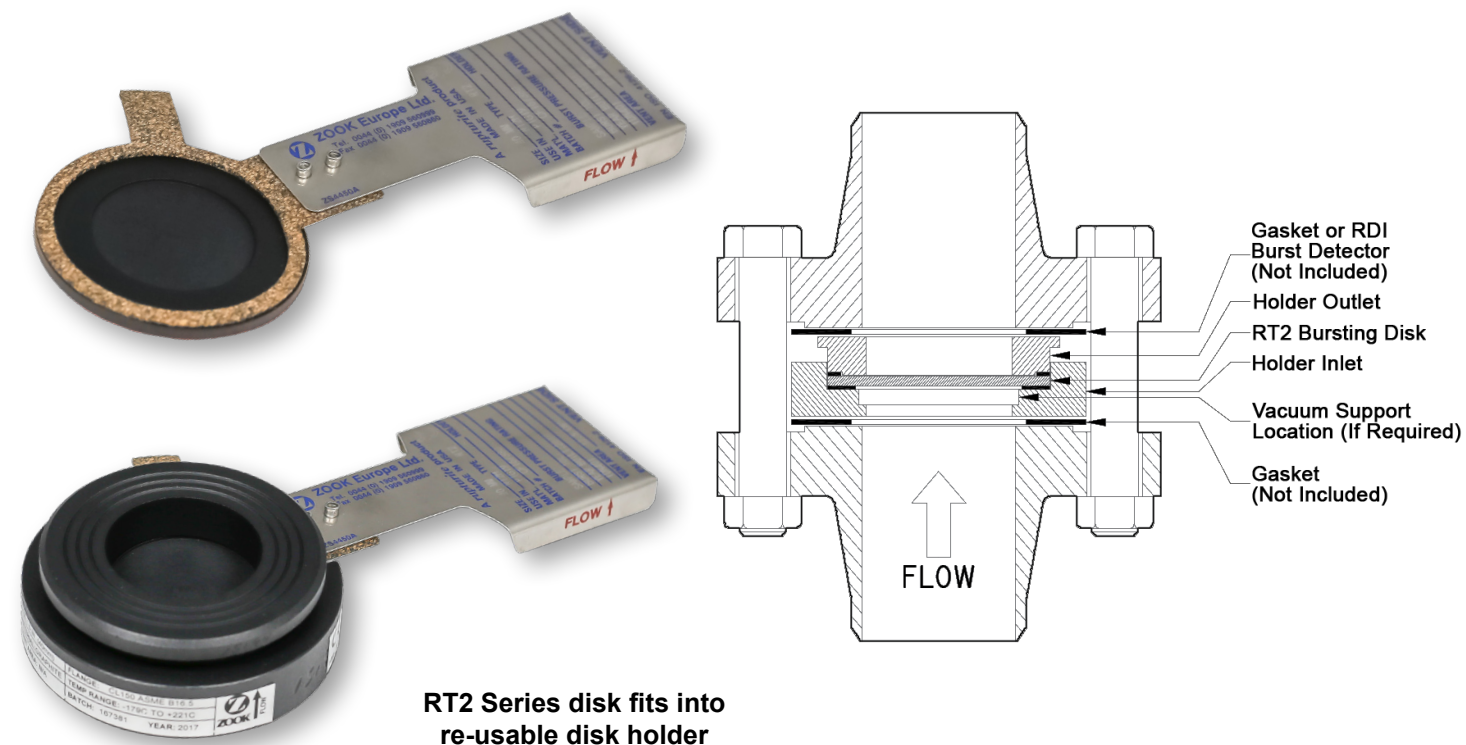
### Notes:

- \*Overall thickness dimension includes two 1/8" (3.18 mm) thick gaskets
- ▲ Generally a minimum differential of 10 psig is required between burst ratings. Contact ZOOK for other burst rating combinations
- Contact ZOOK Engineering for disk sizes above 12" (305 mm)
- Contact ZOOK
- All pressures shown are based on an ambient temperature of 72°F (22°C)
- Not all minimum/maximum pressure and temperature combinations are available. Please contact ZOOK for more information
- Unless otherwise noted, stated MNFA and Kr values apply to the rupture disk only and does not include the addition of external vacuum supports or insulated units



## Features

- The RT2 disk is suitable for gas, liquid or vapour service
- Available in nominal sizes from 1" (25 mm) thru 12" (300 mm)
- Fits into a reusable disk holder
- The ZOOK RT2 type Graphite bursting disk is equivalent to most other manufacturers replacement element type graphite disks, i.e. EHG2, G2, Series 2, E2, and in most cases will fit into their holders (Consult ZOOK first)
- The RT2 disk can handle an operating pressure of up to 90% of the minimum rated burst pressure of the disk
- Standard burst tolerances are +/- 10% for 5 psig (0.34 barg) and above, and +/- 0.75 psig (0.05 barg) for below 5 psig (0.34 barg)
- The RT2 disk can withstand full vacuum if rated at 25 psig (1.72 barg) and above. For disks rated below 25 psig (1.72 barg), a reverse pressure support (RPS) must be fitted into the disk holder. (Note: The RPS is a fixed type vacuum support and will reduce the free flow area of the disk on burst)
- For additional corrosion resistance and wider temperature range special fluoropolymer sintered RT2T disk is available. (Minimum pressure may vary)
- Burst detection available for most applications by fitting RDI detector in place of holder outlet side gasket
- The RT2 disks will be manufactured, where applicable, in accordance to the latest pressure equipment directive (PED) 2014/68/EU (Category IV) and EN-ISO-4126-2 and are CE Marked. Burst test certificates will be supplied with the disks (Third party witness testing is also available if required)
- Standard holder materials available: Graphite, Stainless Steel and FS (fluoropolymer coated stainless steel)



## Specifications

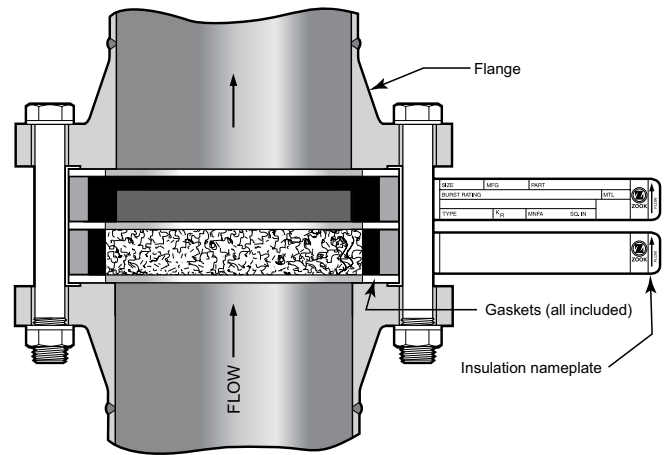
Disk Size				Assembly Heights*				MNFA				Outside Diameter												Burst Ratings								Temperature										
NPS	DN	Actual ID		Metal Holder		Graphite Holder		Graphite & Metal Holder w/o Vacuum Support		Metal Holder w/ Vacuum Support		Graphite Holder w/ Vacuum Support		ASME B16.5 Class	DIN & ISO				ISO ONLY		JIS				RT2 Type Disk				RT2T Type Disk				°F	°C								
		in	mm	in	mm	in	mm	in	mm	in <sup>2</sup>	mm <sup>2</sup>	in <sup>2</sup>	mm <sup>2</sup>		in <sup>2</sup>	mm <sup>2</sup>	150	PN6	PN10	PN16	PN20	5K	10K	16K	20K	Min Pressure (All Flanges)	Min Pressure (All Flanges)	Max Pressure (All Flanges)	Max Pressure (All Flanges)	Min Pressure (All Flanges)	Min Pressure (All Flanges)	Max Pressure (All Flanges)			Max Pressure (All Flanges)							
1	25	25	1	25.4	0.84	21.3	1.16	29.4	0.76	490	0.46	297	0.46	299	2.50	63.5	2.52	64.0	2.80	71.1	2.80	71.1	2.50	63.5	2.48	62.9	2.80	71.1	2.80	71.1	10	0.69	1000	68.97	20	1.38	1000	68.97	-290 to 500	-179 to 260		
1-½	38	40	1.5	38.1	0.96	24.3	1.26	32.0	1.94	1,251	1.08	693	1.10	712	3.25	82.5	3.39	86.1	3.62	91.9	3.62	91.9	3.25	82.5	3.15	80.0	3.39	86.1	3.39	86.1	7	0.48	1000	68.97	20	1.38	1000	68.97	-290 to 500	-179 to 260		
2	50	50	2	50.8	1.03	26.1	1.33	33.7	3.04	1,961	2.15	1,385	1.88	1,218	4.00	101.6	3.78	96.0	4.21	106.9	4.21	106.9	4.00	101.6	3.54	89.9	3.98	101.0	3.98	101.0	3	0.21	300	20.69	15	1.03	300	20.69	-290 to 500	-179 to 260		
2-½	64	65	2.5	63.5	1.26	32.0	1.50	38.1	5.13	3,309	2.81	1,816	2.97	1,920	4.75	120.6	4.59	116.5	5.00	127.0	5.00	127.0	4.75	120.6	4.52	114.8	4.76	120.9	4.76	120.9	3	0.21	■	■	■	■	■	■	■	■	■	
3	76	80	3	76.2	1.33	33.7	1.68	42.6	7.79	5,025	4.28	2,759	3.74	2,415	5.25	133.3	5.20	132.0	5.59	141.9	5.59	141.9	5.25	133.3	4.96	125.9	5.16	131.0	5.39	136.9	5.39	136.9	2	0.14	300	20.69	10	0.69	300	20.69	-290 to 500	-179 to 260
4	102	100	4	101.6	1.47	37.3	1.92	48.7	12.17	7,851	8.17	5,272	7.80	5,037	6.75	171.4	5.98	151.8	6.38	162.0	6.38	162.0	6.75	171.4	5.75	146.0	6.14	155.9	6.38	162.0	6.38	162.0	2	0.14	250	17.24	8	0.55	250	17.24	-290 to 500	-179 to 260
6	152	150	6	152.4	1.63	41.4	2.53	64.2	27.39	17,670	17.11	11,036	17.64	11,385	8.63	219.2	8.15	207.0	8.58	217.9	8.58	217.9	8.63	219.2	8.31	211.0	8.54	216.9	8.54	216.9	8.54	216.9	2	0.14	170	11.72	4	0.28	170	11.72	100 and less	38 and less
																																	2	0.14	85	5.86	8	0.55	85	5.86	>100	>38
8	203	200	8	203.2	2.02	51.3	3.35	85.0	48.69	31,412	26.75	17,259	27.6	17,806	10.88	276.3	10.31	261.8	10.75	273.0	10.75	273.0	10.88	276.3	10.12	257.0	10.51	266.9	10.51	266.9	10.51	266.9	1	0.07	170	11.72	4	0.28	170	11.72	100 and less	38 and less
																																	1	0.07	85	5.86	6	0.41	85	5.86	>100	>38
10	254	250	10	254.0	2.27	57.6	4.23	107.4	76.08	49,083	51.84	33,442	38.33	24,730	13.25	336.5	12.48	316.9	12.91	327.9	12.91	327.9	13.25	336.5	12.68	322.0	12.99	329.9	12.99	329.9	12.99	329.9	1	0.07	150	10.34	3	0.21	150	10.34	100 and less	38 and less
																																	1	0.07	80	5.52	4	0.28	80	5.52	>100	>38
12	305	300	12	304.8	2.72	69.0	5.07	128.7	109.56	70,683	58.91	38,007	60.80	39,225	16.00	406.4	14.69	373.1	14.88	377.9	14.88	377.9	16.00	406.4	14.45	367.0	14.76	374.9	14.76	374.9	14.76	374.9	1	0.07	150	10.34	3	0.21	150	10.34	100 and less	38 and less
																																	1	0.07	80	5.52	4	0.28	80	5.52	>100	>38

Notes:  
 \*Assembly heights exclude flange gaskets  
 ▲ Max pressure based on max design Pressure/Temperature of companion flanging selected  
 ■ Contact ZOOK  
 • All pressures shown are based on an ambient temperature of 72°F (22°C)  
 • Not all minimum/maximum pressure and temperature combinations are available. Please contact ZOOK for more information

## Insulated Unit Type

### Features

- For temperatures exceeding 430°F (221°C) to 700°F (371°C)
- Furnished as an attached unit. Disk's nameplate rating must be established at the cold face temperature of the insulation
- NOT available for Two-Way disks or disks with ring or plate vacuum supports
- Insulated Units are supplied armored with required insulation and gaskets for service above 430°F (221°C) to 700°F (371°C). Standard armor is carbon steel, gaskets are compressed fiber, and insulation is spun alumina/silica. This insulation prohibits use with liquids and some corrosives
- For temperatures exceeding 700°F (371°C) contact ZOOK
- Contact ZOOK for flow reduction factor when using Insulated Unit



**Note:**  
Insulated Disks cannot be used with liquids, hydrofluoric and phosphoric acids or concentrated alkalis

## Graphite Screw Type (GST)

By utilizing a graphite rupture disk mounted between stainless steel inlet and outlet connection sealing on an O-ring, ZOOK can provide low burst ratings, operating ratios of 90%, and leak rates better than  $1 \times 10^{-5}$  std. cc/sec helium gas.\*

### Features

- Designed for use with Inverted Type rupture disks
- Ideal for pressure ratings from 20 psig (1.38 barg) to 1000 psig (68.97 barg)
- Unit consists of 4 components: Inlet, Outlet, O-ring, and Rupture Disk
- Standard outlet connections: muffled\*\*, free (open to atmosphere) or threaded
- O-ring is supplied with the rupture disk. The outlet nut provides the compression required to seal the disk against the O-ring
- Standard material of construction: 316 Stainless Steel (Other materials available, contact ZOOK)



**Notes:**  
\*Leak rate based on graphite disk and o-ring seal  
\*\*Muffled outlets reduce noise levels and redirect fragment or product released when the rupture disk bursts

## Features

- SD Disks are an extension of ZOOK's impervious Graphite Rupture Disk Design
- Provides over-pressure protection in sanitary piping system
- Ideal for high purity and corrosion service
- Rugged design
- FEP lined to help resist product buildup
- Full bore opening upon rupture
- FDA compliant when FEP liner attached
- Nominal I.D. equals the fitting size
- Self-Supporting under full vacuum at set pressures of 25 psig (1.72 barg) or higher
- Excels in liquid, gas, or two-phase applications
- 0% manufacturing range is standard
- Standard operating ratio of 90% of the marked rating on the disk tag. Higher operating ratio may be available upon request. Contact ZOOK for operating ratio on pressures below 40 psig (2.76 barg)
- Installs using industry standard Tri-clamp®/Tri-clover® fitting
- Wide body clamp required (Stocked by ZOOK)
- Standard gasket material: Black Buna-N
- Sizes 1" (25mm) through 4" (100mm)
- ASME (UD), and PED (CE) compliance available (Third party witness testing is also available if required)

## Applications

Food processing, dairy, breweries, pharmaceutical, distilling, baking, canning, cosmetics, biotechnology, and petrochemical industries

## Optional Features

- Burst indication (Ferrule mounted)
- Torque-rite® sanitary clamp nut (eliminates the problems associated with over/under tightening)

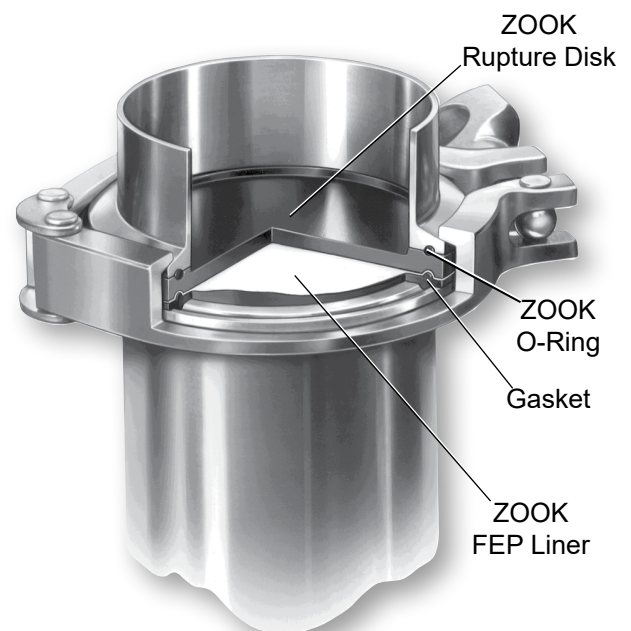
## Specifications

Disk Dimensions - inches (mm)			Burst Pressures psig (barg) @72°F (22°C)	
I.D. (Nominal)	O.D.	Thk.	Minimum	Maximum
1"	1.984	0.250	10	50
25 mm	50.3	6.3	(0.690)	(3.447)
1-1/2"	1.984	0.250	7	50
40 mm	50.3	6.3	(0.483)	(3.447)
2"	2.516	0.250	3	50
50 mm	63.9	6.3	(0.207)	(3.447)
2-1/2"	3.047	0.250	2	50
65 mm	77.3	6.3	(0.138)	(3.447)
3"	3.579	0.250	2	50
80 mm	90.9	6.3	(0.138)	(3.447)
4"	4.682	0.250	1.5	50
100 mm	118.9	6.3	(0.104)	(3.447)

Standard burst tolerances apply

**Notes:**

- Max disk temperature is dependent on gasket material selected
- Alternate sizes, disk materials, gasket materials and lower burst ratings may be available on request. Contact ZOOK for more information.
- Maximum disk pressure based on clamp rating



## Features

- Ideal for Railroad tank cars
- Allows extended use for a full year without change-out regardless of number of trips logged
- Unaffected by virtually all corrosives except elemental Fluorine
- Supplied in two styles to fit either metal seated or fully rubber covered 2" (50 mm) AAR safety vents
- Both Model AC and RC carried in stock for immediate delivery
- Steel armored for added strength
- Flexible liner used on pressure side to automatically provide a degree of temporary reclosure after venting an overpressure incident
- Supports full vacuum
- PTFE lined on pressure side
- PTFE coated on vent side to prevent chemical attack from either side
- High Visibility Green FEP Coating: Visual indication of disk integrity and easy inspection
- 165 psig (11.38 barg) RC and AC series disks are available for RAPID Delivery. Contact ZOOK for more information

### Model RC

Designed to fit standard AAR 2" (50 mm) metal seated safety vents.

#### Gasketing

Non asbestos on vent side VITON on pressure side. AAR 2" (50 mm) metal seated safety vent accepts ZOOK Model RC Disk.

Models	Burst Rating		Outside Diameter	
	psig	barg	in	mm
RC60	60	4.137	3-1/8	79.3
RC100	100	6.895		
RC165	165	11.376		



### Model AC

Designed for fully rubber covered 2" (50 mm) safety vents without precise seats. This disk features a larger outside diameter.

#### Gasketing

Non asbestos on vent side VITON on pressure side. AAR 2" (50 mm) rubber covered safety vent accepts ZOOK Model AC Disk.

Models	Burst Rating		Outside Diameter	
	psig	barg	in	mm
AC60	60	4.137	4-3/4	120.6
AC100	100	6.895		
AC165	165	11.376		



VITON - Trademark of DuPont

#### Note:

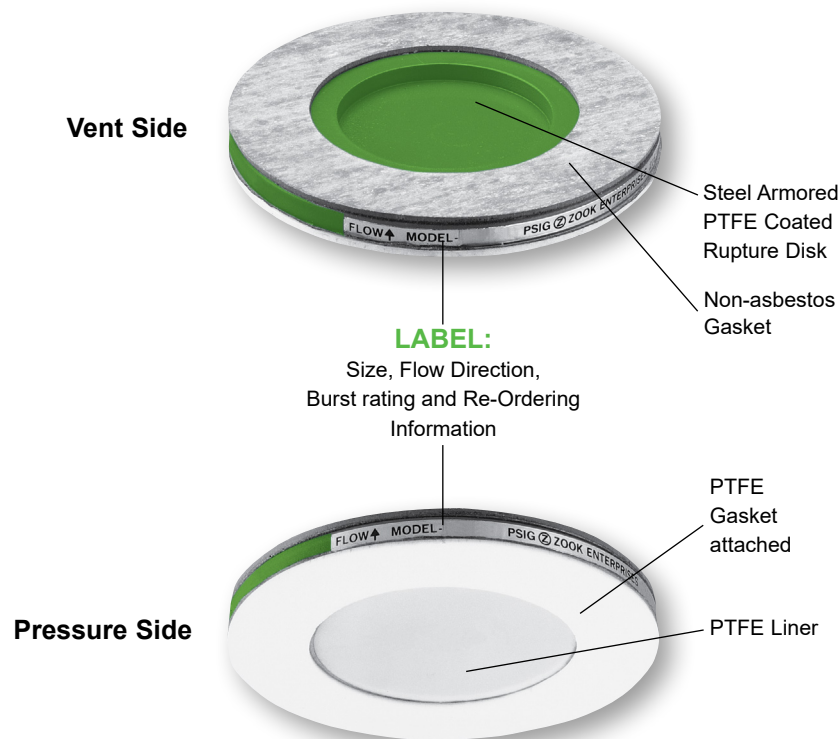
From each lot of ZOOK Rupture Disks, at least two disks are burst in the appropriate AAR safety vent to qualify burst rating as specified in AAR A5.03. Additionally, these disks have been qualified for -15% +0% tolerance per AAR A5.04.

## Features

- Superior fatigue resistance allows extended use for a full year without change-out regardless of number of trips logged
- Fail Safe Design: TD Disks will rupture prematurely when installed upside down
- High Visibility Green PTFE Coating: Visual indication of disk integrity and easy inspection
- Designed specifically for use in over-the-road tank trailer applications
- Provides reliable high performance at low cost
- Unaffected by virtually all corrosives except elemental Fluorine
- Replaces lesser performing metal and graphite type disks
- Operating pressures to 90% of the disk's marked burst pressure
- No disk holder required
- Supports full vacuum
- Fits ANSI Class 150 flanges
- Sizes 2", 3", 4"
- Temperature ratings to 72°F (22°C) (Contact ZOOK for other sizes, burst and temperature ratings)
- Burst performance: ± 5% of the marked burst rating
- 0% manufacturing range
- ASME UD marking available

## Dimensions

Rupture Disk Nominal Size		Thickness Includes Gaskets		Outside Diameter	
in	mm	in	mm	in	mm
2	50	.375	9.5	4	100
3	80	.375	9.5	5 ¼	133.35
4	100	.375	9.5	6 ¾	171.45



Gaskets can be supplied loose or attached to the disk (Note: field replacement of gaskets NOT recommended on Two-Way Disks or Insulated Units).

When supplying your own gaskets, follow dimensions in the chart, especially the inside diameter which provides proper clearance to ensure accurate burst. 1/8" (3.18 mm) thick gasket is recommended. Gaskets for Insulated Disks are made from high-temperature material and are always supplied attached.

**Gaskets used with graphite or metal disks are stocked in the following materials:**

- Neoprene
- Compressed fiber
- Solid PTFE
- PTFE envelope

Contact ZOOK for the entire selection of gasket sizes and gasket materials available.



Nominal Size		ID		OD														
		ANSI, ISO, PN20 & PN50	DIN, ISO, & JIS	ANSI			DIN & ISO					ISO ONLY		JIS				
NPS	DN			150	300	600	PN6	PN10	PN16	PN25	PN40	PN20	PN50	5K	10K	16K	20K	30K
1/2"		0.88	0.93	1.75	2.00	2.00	1.73	2.01	2.01	2.01	2.01	1.75	2.00	1.89	2.17	2.17	2.17	2.40
12 mm	15	22.3	23.6	44.4	50.8	50.8	43.9	51.0	51.0	51.0	51.0	44.45	50.8	48.0	55.1	55.1	55.1	60.9
3/4"		1.13	1.13	2.13	2.50	2.50	2.13	2.40	2.40	2.40	2.40	2.13	2.50	2.09	2.36	2.36	2.36	2.60
19 mm	20	28.7	28.7	54.1	63.5	63.5	54.1	60.9	60.9	60.9	60.9	54.10	63.5	53.0	59.9	59.9	59.9	66.0
1"		1.31	1.43	2.50	2.75	2.75	2.52	2.80	2.80	2.80	2.80	2.50	2.75	2.48	2.80	2.80	2.80	2.99
25 mm	25	33.2	36.3	63.5	69.8	69.8	64.0	71.1	71.1	71.1	71.1	63.50	69.8	62.9	71.1	71.1	71.1	75.9
1-1/2"		1.91	2.10	3.25	3.63	3.63	3.39	3.62	3.62	3.62	3.62	3.25	3.63	3.15	3.39	3.39	3.39	3.82
38 mm	40	48.5	53.3	82.5	92.2	92.2	86.1	91.9	91.9	91.9	91.9	82.55	92.2	80.0	86.1	86.1	86.1	97.0
2"		2.50	2.65	4.00	4.25	4.25	3.78	4.21	4.21	4.21	4.21	4.00	4.25	3.54	3.98	3.98	3.98	4.37
50 mm	50	63.5	67.3	101.6	107.9	107.9	96.0	106.9	106.9	106.9	106.9	101.60	107.9	89.9	101.0	101.0	101.0	111.0
2-1/2"		3.25	3.25	4.75	5.00	5.00	4.59	5.00	5.00	5.00	5.00	4.75	5.00	4.52	4.76	4.76	4.76	5.39
64 mm	65	82.5	82.5	120.6	127.0	127.0	116.5	127.0	127.0	127.0	127.0	120.65	127.0	114.8	120.9	120.9	120.9	136.9
3"		3.75	4.00	5.25	5.75	5.75	5.20	5.59	5.59	5.59	5.59	5.25	5.75	4.96	5.16	5.39	5.39	5.79
76 mm	80	95.2	101.6	133.3	146.0	146.0	132.0	141.9	141.9	141.9	141.9	133.35	146.0	125.9	131.0	136.9	136.9	147.0
4"		5.00*	5.00*	6.75	7.00	*	5.98	6.38	6.38	6.61	6.61	6.75	7.00	5.75	6.14	6.38	6.38	6.69
102 mm	100	127.0	127.0	171.4	177.8	*	151.8	162.0	162.0	167.8	167.8	171.45	177.8	146.0	155.9	162.0	162.0	169.9
5"		6.13	6.13	7.63	8.38	*	7.16	7.55	7.55	7.80	7.80	7.63	8.38	7.13	7.36	7.87	7.87	8.07
127 mm	125	155.7	155.7	193.8	212.8	*	181.8	191.7	191.7	198.1	198.1	193.80	212.8	181.1	186.9	199.9	199.9	204.9
6"		7.13	7.13	8.63	9.75	*	8.15	8.58	8.58	8.82	8.82	8.63	9.75	8.31	8.54	9.25	9.25	9.76
152 mm	150	181.1	181.1	219.2	247.6	*	207.0	217.9	217.9	224.0	224.0	219.20	247.6	211.0	216.9	234.9	234.9	247.9
8"		8.88*	9.00	10.88	12.00	*	10.31	10.75	10.75	11.18	11.42	10.88	12.00	10.12	10.51	11.20	11.20	11.54
203 mm	200	225.5	228.6	276.3	304.8	*	261.8	273.0	273.0	283.9	290.0	276.35	304.8	257.0	266.9	284.4	284.4	293.1
10"		11.63	11.38	13.25	*	*	12.48	12.91	12.95	*	*	*	*	12.68	12.99	13.90	*	*
254 mm	250	295.4	289.0	336.5	*	*	316.9	327.9	328.9	*	*	*	*	322.0	329.9	353.0	*	*
12"		13.75	13.25	16.00	*	*	14.69	14.88	15.12	*	*	*	*	14.45	14.76	15.87	*	*
305 mm	300	349.2	336.5	406.4	*	*	373.1	377.9	384.0	*	*	*	*	367.0	374.9	403.1	*	*
14"		14.50	15.31	17.63	*	*	16.65	17.24	17.48	*	*	*	*	16.14	16.54	17.60	*	*
356 mm	350	368.3	388.8	447.8	*	*	422.9	437.9	443.9	*	*	*	*	409.9	420.1	447.0	*	*
16"		17.00	17.41	20.13	*	*	18.62	19.25	19.49	*	*	*	*	18.50	19.02	19.96	*	*
406 mm	400	431.8	442.2	511.3	*	*	472.9	488.9	495.0	*	*	*	*	469.9	483.1	506.9	*	*
18"		19.50	19.50	21.50	*	*	20.79	21.22	21.85	*	*	*	*	20.87	21.81	22.52	*	*
457 mm	450	495.3	495.3	546.1	*	*	528.0	538.9	554.9	*	*	*	*	530.1	553.9	572.0	*	*
20"		21.75	21.53	23.75	*	*	22.76	23.39	24.29	*	*	*	*	22.83	23.35	24.69	*	*
508 mm	500	552.4	546.8	603.2	*	*	578.1	594.1	616.9	*	*	*	*	579.8	593.0	627.1	*	*
24"		25.00	25.00*	28.13	*	*	26.73	27.36	28.90	*	*	*	*	27.09	27.44	28.78	*	*
610 mm	600	635.0	635.0	714.5	*	*	678.9	694.9	734.0	*	*	*	*	688.0	696.9	731.0	*	*

Note: \*4"-300 ANSI and ISO PN50 ID equals 4.75" (120.65 mm); 8.00" (203.20 mm)-300 ANSI and ISO PN50 ID equals 9.00" (228.60 mm); 24" (609.60 mm) DIN PN16 and JIS 16K equals 25.80" (655.32 mm)

Refer to the chart to determine which disk is best suited for your system fluid. Corrosives not shown can typically be accommodated by our unlined graphite rupture disks. If in doubt, use the Duplex or FS Disks or contact ZOOK to obtain a material sample for testing.

Depending on the type of options, ZOOK graphite rupture disks can be subjected to almost any corrosive with the exception of free fluorine. A reference guide with corrosion resistance information is available upon request for use when specifying ZOOK graphite rupture disks. This guide offers compatibility with common corrosives. Where there is doubt about compatibility, a sample of ZOOK graphite can be supplied on request for your on-site evaluation. Please contact the factory if you have any questions.

Chemicals requiring ZOOK Duplex & FS Type Disk	
F = Specify Duplex Disk with FEP liner or FS Disk	
Aluminum Hydroxide	Iodine – F
Aststine	Lithium
Bromine – F	Nitric Acid
Bromine (water) – F	Nitrous Acid
Calcium Chlorate	Nitrous Oxide
Calcium Hydroxide	Oleum
Calcium Hypochlorite	Potassium (Liquid)
Castor Oil	Potassium Chlorate
Caustic Potash	Potassium Hydroxide
Caustic Soda	Potassium Hypochlorite
Chloral – F	Potassium Persulfate
Chlorine Trifluoride – F	Rubidium (Liquid)
Chlorobenzene – F	Sodium Chlorate
Chloroform – F	Sodium Hydroxide
Chromic Acid	Sodium Hypochlorite
Francium	Sulfuric Acid
Hydrofluoric Acid	Sulfurous Acid
Hydrogen Peroxide	Sulfur Trioxide (Oleum)

**Note:**  
Standard liner materials is PTFE. Other liner materials available upon request: FEP, PFA, Kynar®, Halar®

The information in this chart should be used as a general guide to the selection of the suitable material. Variations in the chemical behavior could be different due to factors such as temperature, pressure, concentration or mixture of chemicals. While utmost care was used in compiling this chart, we assume no responsibility for it's accuracy and completeness. Specifications are subject to change without notice.

### Interchanging with Other Manufacturer's Product

ZOOK's impervious graphite rupture disks are impregnated with a proprietary resin to provide superior performance and corrosion resistance. Other brands of graphite rupture disks should not be considered equal and interchangeable.

### Warning

**If a disk ruptures, material may:**

- Vent at high velocity with significant reaction thrust force
- Contain disk particles and other solids and liquids
- Be toxic or flammable

The end user must make provisions to prevent personal injury and equipment damage. Use of disks described in this bulletin are intended for use only by persons with requisite technical skill and at their own discretion and risk. Because application, installation, and use are beyond our control, we make no warranties expressed or implied and do not assume any liability exceeding purchase price of the disk. It is the responsibility of the end user to fully understand his process and determine the disk needed to properly protect the system.

### Testing Method

Testing is conducted to the standard selected by the client including PED and ASME codes. Maximum accuracy testing is carried out at the disk rated temperature.

### ASME Code and EU Jurisdictional Regulations

Many jurisdictions in North America require ASME Code compliance on Boiler and Pressure Vessel construction. All pressure vessels within the scope of the ASME Code Section VIII, Div. 1 shall be provided with pressure relief devices. It is the responsibility of the user to ensure that the required devices are properly installed prior to initial operation of the pressure vessels.

If company policy or jurisdictional regulation requires ASME Code compliance, the rupture disk devices used for pressure vessel overpressure protection shall bear the ASME Code UD symbol. The UD marking is the manufacturer's declaration that the device was manufactured in full compliance with the ASME Code.

Disks specified to ASME Code requirements are rated using a 0% MDR unless a special MDR is specified and agreed upon. 0% MDR disks are marked with the specified burst rating. Refer to the certified type for the flow resistance factors (Kr) and the Minimum Net Flow Area (MNFA).

European jurisdictions may require compliance with the Pressure Equipment Directive (PED 2014-68-EU). PED has been a requirement in the European community since May 29th, 2002 and covers vessels, piping, safety accessories, steam generators, and accessories and assemblies with a pressure greater than 0.5 barg. Pressure equipment in compliance with the PED is affixed with the CE marking. ZOOK has a range of rupture disk types approved to carry the CE marking.

Each lot of rupture disks required to carry the CE mark is tested in accordance to PED 2014-68-EU and EN ISO 4126-2 standards. Disks with marked burst pressures 0.5 barg or below do not require PED compliance, but may be tested under EN ISO 4126-2.

### Pressure Ratings and Burst Tolerances

Burst ratings range from 0.25 psig (0.02 barg) to above 1000 psig (68.95 barg) for sizes 1/2" (15 mm) thru 24" (600 mm). Refer to minimum and maximum values in tables provided for each disk. Standard burst tolerances are:

Pressure Rating @ 72°F (22°C)		Burst Tolerance	
psig	barg	psi	bar
Above 40	Above 2.76	+/- 5%	+/- 5%
15 to 40	1.03 to 2.76	+/- 2.00	+/- 0.14
5 to less than 15	0.34 to less than 1.03	+/- 1.00	+/- 0.07
Above 1 to less than 5	Above 0.07 to less than 0.34	+/- 0.75	+/- 0.05
1 or less	0.07 or less	+0.75 / -0	+0.05 / -0

### O2 Cleaning

For use in oxygen environments, ZOOK can provide oxygen cleaning services for graphite rupture disks and all associated parts including gaskets and liners. If disk is armored, stainless steel is required.



### Vacuum

Disks are self-supporting up to full vacuum at burst ratings of 25 psig (1.72 barg) and higher. At lower pressures, integral vacuum supports are available for MONO and FSV Disks. External vacuum supports are available for Duplex and FS Disks. Contact ZOOK for partial vacuum services.

### Dimensional Standards

Standard disks fit directly between industry standard flanges ASME B16.5, ISO and JIS with flat or raised faces. Flat ring gaskets are required and can be attached to the disk before shipment.

### Capacity and Flow Resistance

Full bore opening at time of rupture is a consistent characteristic of ZOOK Disks and results in very low flow resistance values (Kr). Refer to Kr values in tables provided for each disk type.

### Service Life

Each installation of a rupture disk has unique operating conditions that cumulatively affect the service life of the disk on an installation by installation basis. User experience is the best indicator in determining the frequency of planned maintenance change-out of a rupture disk. Cyclic service requires a more frequent change out schedule than static service due to material fatigue.

Good practice is to schedule inspection of the disk when scheduling preventative maintenance. Indicators that it's time to replace a graphite rupture disk may include premature burst, exposure to pressure above the operating ratio, corrosion, product build-up, damage including cracks or scratches, and leakage. Replace the disk immediately if any of these indicators are identified during preventative maintenance and update the change out schedule accordingly. Flange mounted disks with integral gaskets are designed for one-time installation only and should be replaced if removed from mating flanges.

### Burst Sensors

For remote and quick detection of a ruptured condition, ZOOK offers various burst sensors. ZENSOR™: Rupture disk and sensing element are integral parts of the electrical circuit to eliminate false readings. Model BA: An external re-usable and replaceable indicator. Specify Model BA-L for optional leak detection. RDI: One time use rupture disk indicator.

### Armor

Armor is available on any standard style, size and rating of graphite rupture disk. Standard material is Carbon Steel (316SS optional).

Armor is required on the following:

- Disks for ASME B16.5 Class 300 flanges
- Two-way Type Disks
- Disks rated for temperatures above 338°F (170°C), regardless of disk style or flange class
- Disks for ASME B16.5 Class 150 flanges. See table at right with the following sizes and burst ratings:
- Higher PN/JIS flange rating would also require armor (PN25/40) in addition to CL300
- Armor is required when designing/sizing for overpressure protection in fire case scenario

Sizes		Rated Over @ 72°F (22°C)	
in	mm	psig	barg
1/2 - 3	15 - 80	150	10.34
4	100	100	6.89
6 - 10	150 - 250	75	5.17
12 - 24	300 - 600	50	3.45

Disks not covered above are furnished unarmored unless armor is specifically ordered. Armor is highly recommended for: Added Safety, Greater Reliability, and Easier Installation.

### Installation

ZOOK graphite rupture disks fit directly between standard flanges without the need for additional holders.

A flow arrow on each disk indicates proper orientation.

Armor provides additional protection from extraneous stress to the disk resulting from misaligned piping.

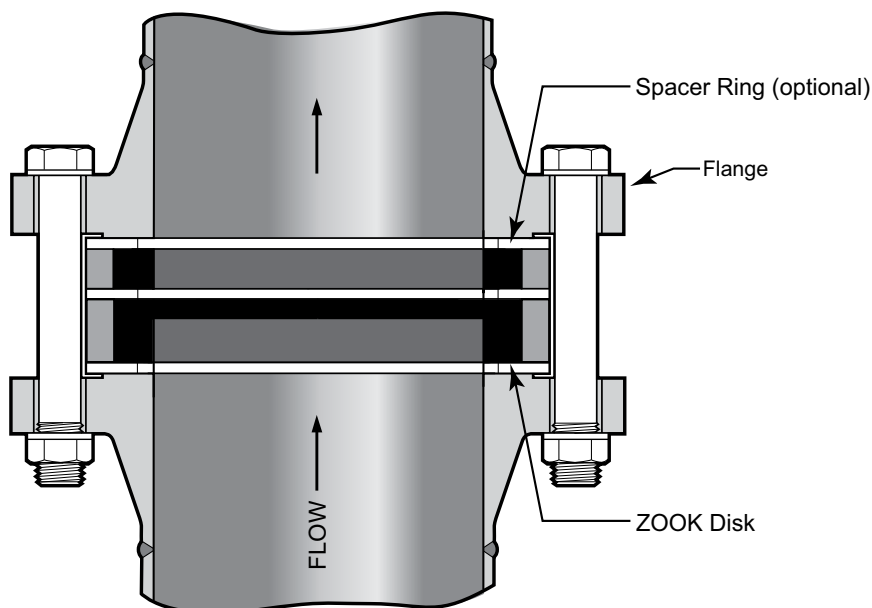
Armor is standard on selected diameter and burst ratings and is required in fire case and toxic services.

Gaskets should be ring type, nonmetallic, relatively soft, and properly sized.

**Normal good practice should be followed when making flange connections. Particular attention should be paid to ensure:**

- Concentric alignment of the disk and gaskets
- Uniform cross-tightening of flange bolts
- Adequate support of piping to withstand external loading and thrust during blowdown
- Protection of personnel and equipment against high velocity open discharge of process material and rupture disk particles

When replacing a metal rupture disk with a ZOOK graphite rupture disk, a graphite lined armored spacer ring can be provided to fill the space of existing flange face-to-face distance, eliminating the need for piping modifications. Detailed installation instructions are provided with each disk.



**Graphite Rupture Disk Replacement**

**ZOOK** is committed to finding pressure relief solutions for our customers that maximize their productivity and performance while keeping them safe. ZOOK is a global market leader with over 90 years of manufacturing expertise of high quality metal & graphite rupture disks and other pressure relief products. ZOOK has global locations in the USA, United Kingdom, Canada and Malaysia, with state-of-the-art manufacturing facilities in Canada and the USA.

Our products are sold in 65+ countries and to-date have over 6,000 customers buying our products worldwide.

We are dedicated to investing heavily in the latest technology and production to stay competitive in the marketplace, and are able to offer comprehensive solutions to the selection and sizing of products best suited for each customer application.

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