



# **PRESSURE / SAFETY DEVICES**

*RUPTURE DISC / EXPLOSION PANEL*

*N2 BLANKETING SYSTEM / EMERGENCY RELIEF HATCH*

*The Leader of Safety Equipment*



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 **FDC**<sup>TM</sup> FDC Co., Ltd.



# CEO MESSAGE

FDC(株)公司是在韩国国内最初将Rupture disc国产化成功的领头企业。  
20多年来生产Rupture disc而积累的经验, 产品可与世界优秀企业媲美。  
根据KS B ISO 4126/6718, KOSHA, ASME Code Sec, VIII和ISO-9001:2008的品质体系,  
完美的制作了Rupture disc.

并且, 为了为从爆炸等危险中保护顾客的宝贵财产和生命安全,  
而不断研究开发新产品和进行产品的品质改善.

主要生产产品为Rupture disc, Explosion panel, N2 Blanketing System, Emergency  
Relief Hatch等. 这种产品适用于微压储藏容器, 各种压力容器, 产业Plants, Reactors, 船舶等多种  
领域的压力安全装置, 并且参与过国家防卫产业开发项目, 其性能和品质已被认证.

我公司将顾客的安全和品质保证视为第一, 为能够成为与顾客同行的FDC而尽最大努力.

而且, 在Rupture disc 等压力安全装置领域里将保护韩国的自尊心, 这也将是FDC的自豪.

代表理事

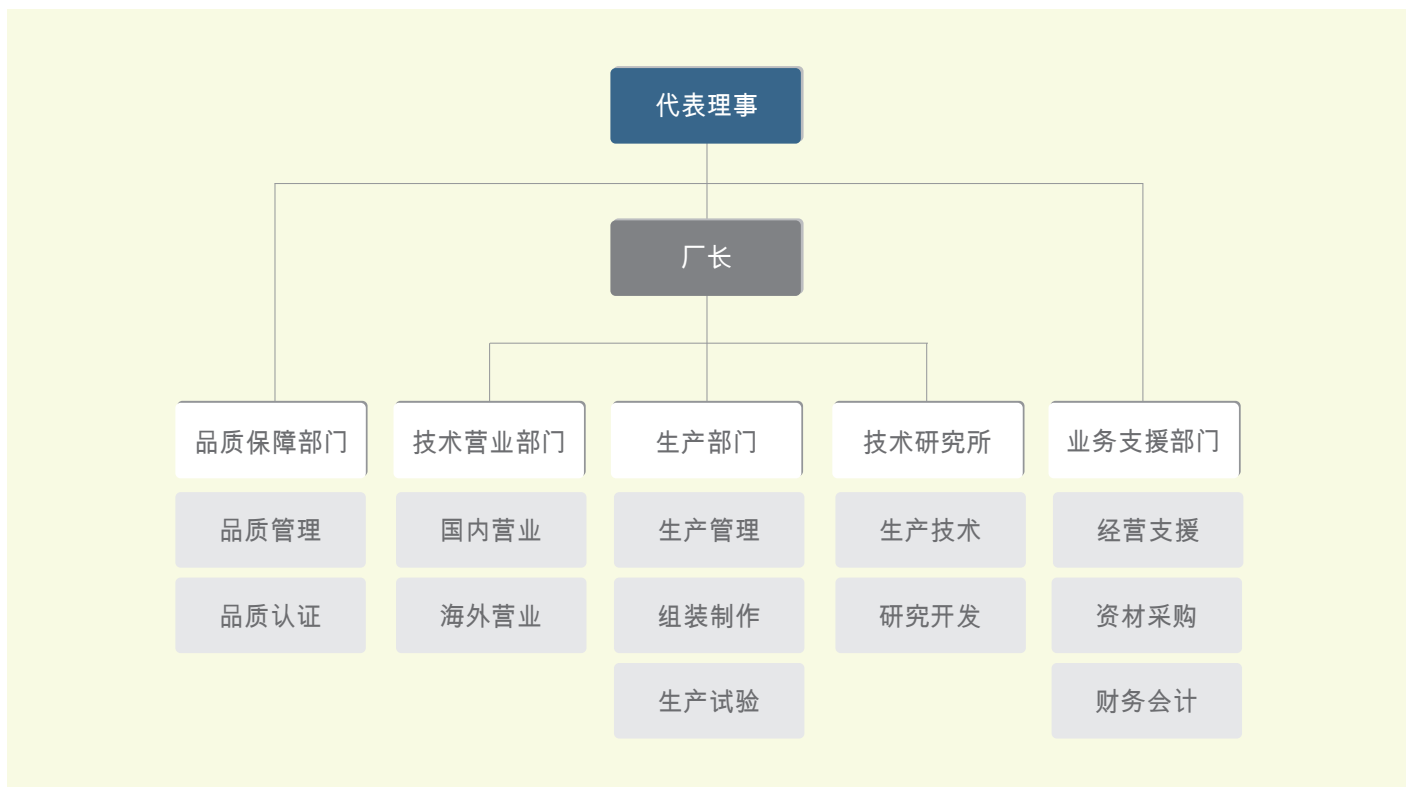
尹 河 远





庆尚南道 金海市酒村面良洞里 368-13

## ORGANIZATION CHART



# Building with proud HISTORY

- 2012**

  - 获得CE Mark(PED)认证 - EC type-Examination(Module B)
  - 获得SEL(中国特种设备制造许可)认证
  - KOSHA安全认证 - 共持有69个形式的认证
  - 登录为韩国水利原子力预备品供货企业
- 2011**

  - 获得CE Mark(PED)认证 - QA System(Module D)
  - 获得俄罗斯'GOST'认证
  - 增加了6个形式的KOSHA安全认证
  - 获得了技术革新型中小企业(INNO-BIZ)认证.
- 2010**

  - 增加获得了 14个形式的KOSHA 安全认证
  - 名称改为'FDC(株)' - FDC Co.,Ltd.
  - 设立企业附属研究所
  - 获得KOSHA防护装置品质部分优秀奖
  - 20台核心部件素材开发事业 - 知识经济部国家政策课题
  - 被选为专利明星企业 - 专利厅/商会议所
  - 被指定为输出有望中小企业 - 中小企业厅
  - 构造室温试验设备
- 2009**

  - 增加获得45个形式KOSHA安全认证
  - 开发Rupture Disc Size Calculation Program
  - '推进-持续'火箭推进器开发事业 - 防卫事业厅
  - 登录为防护装置制造企业(KOSHA)
  - 加入制造物责任保险(PL保险) - 3亿韩币
- 2008**

  - 更换法人 - Fine Disc(株)
- 2007**

  - 实行中小企业生产环境, 革新技术开发课题
- 2006**

  - 仁济大学产学共同技术开发事业 - 构造Scored Type生产体系
- 2004**

  - Scored Type Rupture Disc国产化成功
- 2003**

  - 开发超微压Rupture Disc
  - 'KS B ISO 6718/4162-2/4162-6' 参与Rupture Disc规格顾问
- 2002**

  - 构造ISO 9001:2000 品质认证体系
  - 独自开发N<sub>2</sub>, Blanketing System
- 2000**

  - 构造大型尺寸的Rupture Disc生产体系
- 1999**

  - Fine Disc分公司 - Rupture Disc 专门公司
- 1995**

  - 共同研究开发KIMM(韩国机械研究院)和Rupture Disc Test Program
- 1991**

  - 韩国Tanktech内成立Rupture Disc事业部门

# FDC提供高品质产品, 并且通过不断研究开发和经营革新, 向世界一流企业进行挑战

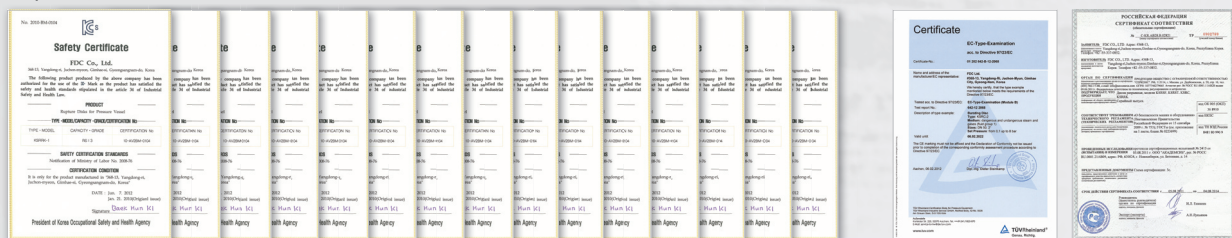
## 登记证以及认证书



## 专利以及知识产权



## Rupture disk 形式认证



# RUPTURE DISC

## 爆破片介绍

### 1. 什么是Rupture disc

- 在压力体系内发生超出有限压力以上的超压情况时, 为泄放超出的压力而使用的非机械安全装置

### 2. 适用时期

- 反映过强等压力快速上升时
- 因固定物而担心其他安全装置的功能低下时
- 不允许任何泄露情况
- 使用强腐蚀性流体时
- 因综合反映等需要瞬间大量放出流量时
- 高温, 低温等恶化条件

### 3. 特征

- 特殊材料和构造(容易选定材料, 经济化)及 无Size 限制
- 一定的破裂功能和放出流体残量
- 排出瞬间流量的最大容量
- 广泛的使用环境(强腐蚀性, 温度, 液体, 气体, 蒸气, 粉体等)
- Zero Leakage
- 延长安全阀的寿命
- 工程运转中可检验排除侧的 Piping
- 延长大型修理期限
- 容易操作及减少费用

### 4. 适用Code

- ASME Sec. VIII Div.1
- ISO 6718
- ISO 4126-2-6
- API RP520
- KOSHA 认证

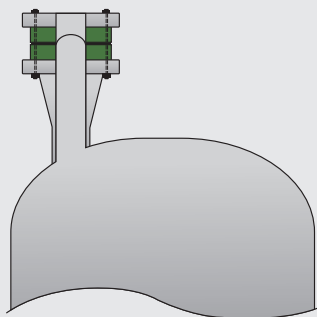


## 5. Rupture disk 材质 - Holder/Disc/Accessory

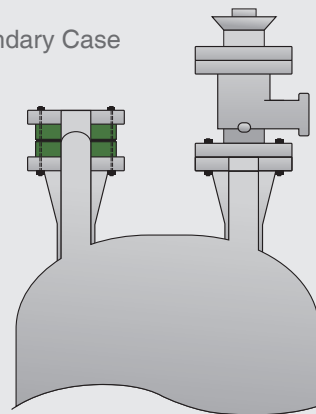
- Stainless Steel (304SS, 316SS, 317SS, etc)
- Carbon Steel
- Duplex
- Aluminum
- Nickel, Inconel, Monel, Hastelloy, Titanium, Tantalum
- Graphite
- Teflon

## 6. Rupture disk의适用

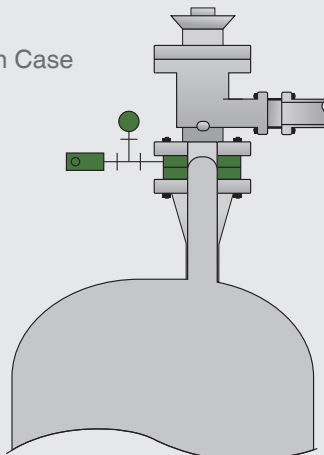
1) Primary Case



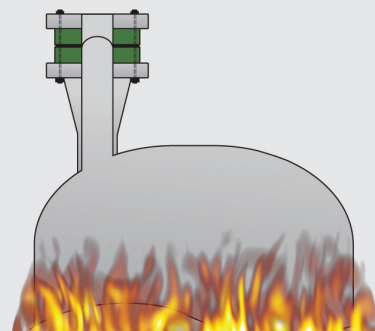
2) Secondary Case



3) Combination Case



4) External Fire Case



# RUPTURE DISC

## KOSHA 义务安全认证

### 1. 义务安全认证

制作危险机械/器具的防护装置和保护装置时, 对于超出安全认证标准的产品粘贴认证标签并允许销售, 此是为了确保产品在制作, 流通及使用时的安全性和可信赖性, 是以预防产业灾害而制作的制度



▶ 义务安全认证 标志

### 2. Rupture Disc 的义务安全认证适用范围

- 适用范围: 从因气体(Gas)或蒸气而引起的超压或超真空中保护压力容器的 Rupture disc  
(但排除使用于开放液体压力的情况或爆破压力不满0.1MPag的情况)

### 3. Rupture disc 的义务安全认证主要内容及要求事项

- 与使用环境一样的温度中实施破裂试验
- 申请认证时与提出式样不同时需要另外同一形式的认证
- 对于进口产品也需要通过义务安全认证才能使用

### 4. 有关法规

- 产业安全保健法
- 产业安全保健法实行令
- 产业安全保健法实行规则
- 防护装置义务安全认证标准告知
- 安全认证及自行安全确认申报的有关告知
- ※ 违反时: 3年以下的劳役或2千万韩币以下的罚款

## 5. 产品功能标准

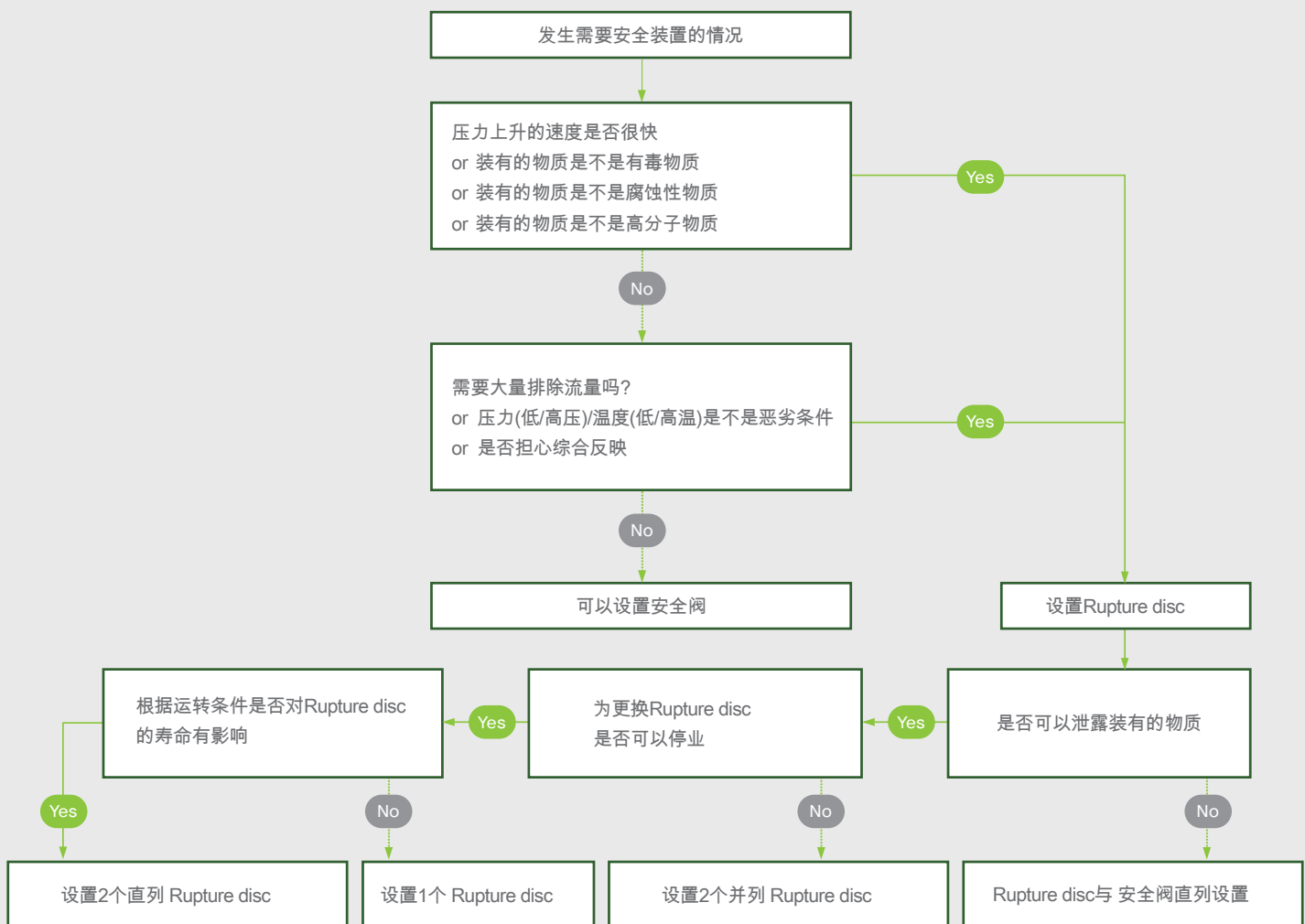
破裂试验	设置压力	不满0.3MPag	0.3MPag 以上
	破裂压力 允许范围	±0.015MPag	±5%
泄露试验	区分		压力维持时间
	爆破片的直径(mm)	50以下	1分
		超过50小于100	2分
		直径	5分
* 达到设置压力的90%时实施泄露试验			
* Flat / Slotted Type 达到设置压力的50%时实施泄露试验			

## 6. KOSHA认证形式的区分及标识

破裂试验	拱型爆破片(C)	单片型(O)					
		复合型(C)					
		Slotted Domed或 Slotted Domed(S)					
	反拱形爆破片(R)	Scored Domed或切断启动型(S)					
		刀片型(K)					
	平爆裂盘(F)	更换型石墨爆破片(R)					
		凸型更换型石墨爆破片(M)					
	切开爆破片(S)						
其他构造(X)	根据以上形态和其他制造商的特性制作的爆破片						
根据直径的区分	直径的区分	I	II	III	IV	V	
	直径的范围(mm)	25以下	超过25 不满50	超过50 不满80	超过80 不满100	超过100	
根据压力等级的区分	压力等级的区分	1	3	5	10	21	22
	破裂压力的范围(MPag)	1以下	超过1 不满3	超过3 不满5	超过5 不满10	超过10 不满21	超过21
形式的标识	<div style="display: flex; justify-content: center; align-items: center; gap: 20px;"> <div style="text-align: center;">             RS 构造         </div> <div style="text-align: center;">             II 直径         </div> <div style="text-align: center;">             3 压力等级         </div> </div>						

# RUPTURE DISC

## 选择指南



# RUPTURE DISC

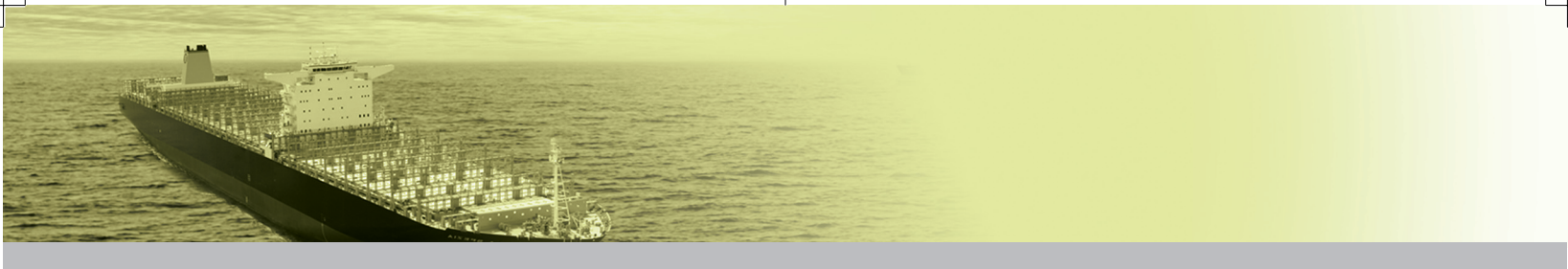
## 选定模型

### STEP 1. 压力容器及工程运转式样 Check (Process Data)

- 使用流体的物质特性
  - Gas or Vapor : 分子量 (Mol weight), 绝热指数(Specific heat ratio), 压缩系数
- 使用流体的状态 : Gas, Vapor, Steam, Liquid 等
- 运转状态 : Static, Pulsation(Oscillation), Cycle 等
- 压力容器的最大允许运转压力(MAWP)
- 最大运转压力及温度
- 要求流量 (Required Capacity)
- Rupture Disc的破裂设置压力及设置温度
- 反压力(Back Pressure)及真空(Vacuum Pressure)
- 材质(Holder/Disc/Accessory)
- Connection(Flange/Fitting)式样
- Rupture Disc 的设置类型 : Primary, Secondary, Combination, External Fire
- 运转费(Operating Ratio)计算 : 运转费 = 最大运转压力/最少破裂压力 X 100  
※ 最少破裂压力 = 设置破裂压力 - 负的爆破压力公差

### STEP 2. 选定Model 及 Accessory

### STEP 3. 计算(By FDC)尺寸及额定运转泄放容量(Rated Capacity)



# RUPTURE DISC SIZING

	ASME SECTION VIII DIV 1
干饱和 蒸气	$A = \frac{W_T}{51.5KP}$ <p>注) 对于1500psig以下的压力将适用以上公式, 对于超过500psig不满3200psig的干燥饱和水蒸气在以上公式计算出来的答案上乘与以下因子而做修正</p> $\left( \frac{0.1906P-1000}{0.2292P-1061} \right)$
气体(Gas) 空气	$A = \frac{W_T}{CKP\sqrt{\frac{M}{T}}}$ (空气的情况, C=356)
液体	$A = \frac{W_T}{2407 \cdot K \cdot \sqrt{(P-P_d) \cdot \rho}}$

	KS B ISO 4126
扼流中的 气体(Gas)/蒸气	$A_o = 3.469 \frac{Q_m}{C \cdot \alpha} \sqrt{\frac{z_o}{P_o}}$ <p>or</p> $A_o = \frac{Q_m}{C \cdot \alpha \cdot P_o} \sqrt{\frac{T_o \cdot z_o}{M}}$ <p>For the homogenized wet steam of 90% or more dryness</p> $A_o = 3.469 \frac{Q_m \cdot \sqrt{x}}{C \cdot \alpha} \sqrt{\frac{z_o}{P_o}}$
亚临界流动中的气 体(Gas)/蒸气	$A_o = 3.469 \frac{Q_m}{C \cdot K_b \cdot \alpha} \sqrt{\frac{z_o}{P_o}}$ <p>or</p> $A_o = \frac{Q_m}{C \cdot K_b \cdot \alpha \cdot P_o} \sqrt{\frac{T_o \cdot z_o}{M}}$
液体	$A_o = 0.621 \frac{W_T}{K_v \cdot \alpha \cdot \sqrt{\Delta P \cdot \rho}}$

$W_T$	泄放流量	(lb/hr)																																																																																				
$A$	爆裂开口的状态下的实际放出面积	(in <sup>2</sup> )																																																																																				
$P$	(所设压力*1.10)+大气压或所设压力+3psia+大气压柱 两种中将使用大值	(psia)																																																																																				
$P_d$	排压 (排出侧的压力)	(psia)																																																																																				
$M$	分子量 (Mol Weight)																																																																																					
$T$	阀入口的绝对温度, °F + 460°F	(R)																																																																																				
$C$	依据绝热指数的气体(Gas)或蒸气的常数 ( $k = C_p / C_v$ )																																																																																					
	<table border="1"> <thead> <tr> <th>k</th> <th>C</th> <th>k</th> <th>C</th> <th>k</th> <th>C</th> </tr> </thead> <tbody> <tr><td>1.00</td><td>315</td><td>1.26</td><td>343</td><td>1.52</td><td>366</td></tr> <tr><td>1.02</td><td>318</td><td>1.28</td><td>345</td><td>1.54</td><td>368</td></tr> <tr><td>1.04</td><td>320</td><td>1.30</td><td>347</td><td>1.56</td><td>369</td></tr> <tr><td>1.06</td><td>322</td><td>1.32</td><td>349</td><td>1.58</td><td>371</td></tr> <tr><td>1.08</td><td>324</td><td>1.34</td><td>351</td><td>1.60</td><td>372</td></tr> <tr><td>1.10</td><td>327</td><td>1.36</td><td>352</td><td>1.62</td><td>374</td></tr> <tr><td>1.12</td><td>329</td><td>1.38</td><td>354</td><td>1.64</td><td>376</td></tr> <tr><td>1.14</td><td>331</td><td>1.40</td><td>356</td><td>1.66</td><td>377</td></tr> <tr><td>1.16</td><td>333</td><td>1.42</td><td>358</td><td>1.68</td><td>379</td></tr> <tr><td>1.18</td><td>335</td><td>1.44</td><td>359</td><td>1.70</td><td>380</td></tr> <tr><td>1.20</td><td>337</td><td>1.46</td><td>361</td><td>2.00</td><td>400</td></tr> <tr><td>1.22</td><td>339</td><td>1.48</td><td>363</td><td>2.20</td><td>412</td></tr> <tr><td>1.24</td><td>341</td><td>1.50</td><td>364</td><td>...</td><td>...</td></tr> </tbody> </table>	k	C	k	C	k	C	1.00	315	1.26	343	1.52	366	1.02	318	1.28	345	1.54	368	1.04	320	1.30	347	1.56	369	1.06	322	1.32	349	1.58	371	1.08	324	1.34	351	1.60	372	1.10	327	1.36	352	1.62	374	1.12	329	1.38	354	1.64	376	1.14	331	1.40	356	1.66	377	1.16	333	1.42	358	1.68	379	1.18	335	1.44	359	1.70	380	1.20	337	1.46	361	2.00	400	1.22	339	1.48	363	2.20	412	1.24	341	1.50	364	...	...	
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$K$	放出系数(设计用系数:一般爆破片适用0.62, 实际测量时为实际测量值*0.8775. 但是必须是0.8775以下)																																																																																					
$Z$	有关P和T的压缩系数 (无可使用的数据时, Z=1.0)																																																																																					
$\omega$	阀入口条件下液体的比重量	(lb/ft <sup>3</sup> )																																																																																				

$A_o$	所需最小流动截面积	(mm <sup>2</sup> )																																																																																																																
$Q_m$	质量流	(kg/h)																																																																																																																
$C$	等熵指数k的函数 (参照表1气体(Gas)的性质)																																																																																																																	
	<table border="1"> <thead> <tr> <th>k</th> <th>C</th> <th>k</th> <th>C</th> <th>k</th> <th>C</th> <th>k</th> <th>C</th> </tr> </thead> <tbody> <tr><td>0.50</td><td>1.81</td><td>1.001</td><td>2.40</td><td>1.26</td><td>2.61</td><td>1.52</td><td>2.78</td></tr> <tr><td>0.60</td><td>1.96</td><td>1.02</td><td>2.41</td><td>1.28</td><td>2.62</td><td>1.54</td><td>2.79</td></tr> <tr><td>0.70</td><td>2.08</td><td>1.04</td><td>2.43</td><td>1.30</td><td>2.63</td><td>1.56</td><td>2.80</td></tr> <tr><td>0.80</td><td>2.20</td><td>1.06</td><td>2.45</td><td>1.32</td><td>2.65</td><td>1.58</td><td>2.82</td></tr> <tr><td>0.82</td><td>2.22</td><td>1.08</td><td>2.46</td><td>1.34</td><td>2.66</td><td>1.60</td><td>2.83</td></tr> <tr><td>0.84</td><td>2.24</td><td>1.10</td><td>2.48</td><td>1.36</td><td>2.68</td><td>1.62</td><td>2.84</td></tr> <tr><td>0.86</td><td>2.26</td><td>1.12</td><td>2.50</td><td>1.38</td><td>2.69</td><td>1.64</td><td>2.85</td></tr> <tr><td>0.88</td><td>2.28</td><td>1.14</td><td>2.51</td><td>1.40</td><td>2.70</td><td>1.66</td><td>2.86</td></tr> <tr><td>0.90</td><td>2.30</td><td>1.16</td><td>2.53</td><td>1.42</td><td>2.72</td><td>1.68</td><td>2.87</td></tr> <tr><td>0.92</td><td>2.32</td><td>1.18</td><td>2.55</td><td>1.44</td><td>2.73</td><td>1.70</td><td>2.89</td></tr> <tr><td>0.94</td><td>2.34</td><td>1.20</td><td>2.56</td><td>1.46</td><td>2.74</td><td>1.80</td><td>2.94</td></tr> <tr><td>0.96</td><td>2.36</td><td>1.22</td><td>2.58</td><td>1.48</td><td>2.76</td><td>2.00</td><td>3.04</td></tr> <tr><td>0.98</td><td>2.38</td><td>1.24</td><td>2.59</td><td>1.50</td><td>2.77</td><td>2.20</td><td>3.13</td></tr> </tbody> </table>	k	C	k	C	k	C	k	C	0.50	1.81	1.001	2.40	1.26	2.61	1.52	2.78	0.60	1.96	1.02	2.41	1.28	2.62	1.54	2.79	0.70	2.08	1.04	2.43	1.30	2.63	1.56	2.80	0.80	2.20	1.06	2.45	1.32	2.65	1.58	2.82	0.82	2.22	1.08	2.46	1.34	2.66	1.60	2.83	0.84	2.24	1.10	2.48	1.36	2.68	1.62	2.84	0.86	2.26	1.12	2.50	1.38	2.69	1.64	2.85	0.88	2.28	1.14	2.51	1.40	2.70	1.66	2.86	0.90	2.30	1.16	2.53	1.42	2.72	1.68	2.87	0.92	2.32	1.18	2.55	1.44	2.73	1.70	2.89	0.94	2.34	1.20	2.56	1.46	2.74	1.80	2.94	0.96	2.36	1.22	2.58	1.48	2.76	2.00	3.04	0.98	2.38	1.24	2.59	1.50	2.77	2.20	3.13	
k	C	k	C	k	C	k	C																																																																																																											
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$z_o$	实际泄放压力及温度中的比体积	(m <sup>3</sup> /kg)																																																																																																																
$P_o$	放出压力	(bar)																																																																																																																
$\alpha$	放出系数 (一般适用0.62)																																																																																																																	
$T_o$	放出温度	(K)																																																																																																																
$Z_o$	实际放出压力及温度中压缩性系数 (无可使用的数据时Z <sub>o</sub> =0.1)																																																																																																																	
$M$	分子量 (Mol Weight)																																																																																																																	
$x$	湿蒸汽的质																																																																																																																	
$K_b$	亚临界流动中因背压的增加,从而理论式容量减少的校正系数 (参照表2有关背压的容量校正系数)																																																																																																																	
$K_v$	与临界雷诺数(Re)有关的粘度校正系数 液体的粘性为20°C的水以下时 (参照图1根据粘性的容量校正系数)																																																																																																																	
$Re$	临界雷诺数 $Re = 0.3134 \frac{Q_m}{\mu \sqrt{A_o}}$																																																																																																																	
$\mu$	液体粘度																																																																																																																	
$\Delta P$	通过保险片所放出的压差 ( $\Delta P = P_o - P_b$ )	(bar)																																																																																																																
$P_b$	背压 (排除侧的压力)	(psia)																																																																																																																

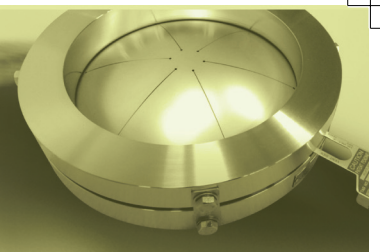


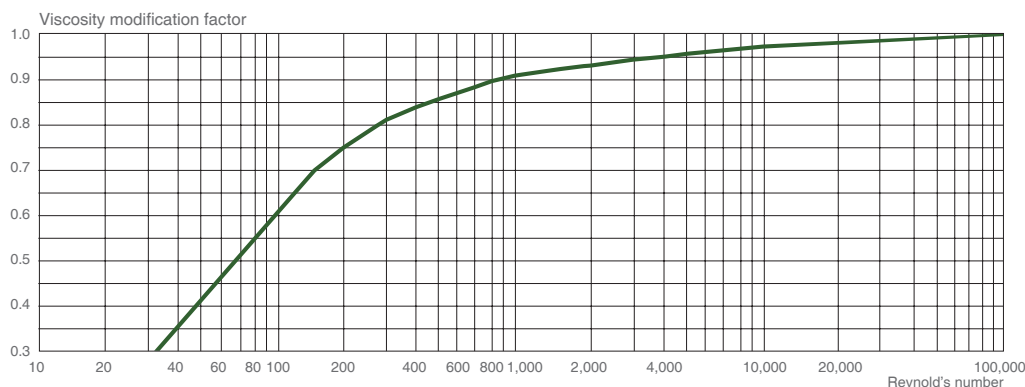
表1. 气体(Gas)气的性质

名称 \ 物性	化学方式	分子量 (M)	断热指数(k)	名称 \ 物性	化学方式	分子量 (M)	断热指数(k)
乙炔 (Acetylene)	C <sub>2</sub> H <sub>2</sub>	26.04	1.26	正己烷 (n-Hexane)	n-C <sub>6</sub> H <sub>14</sub>	86.18	1.06
空气 (Air)	-	28.97	1.40	氯化氢 (Hydrogen chloride)	HCl	36.46	1.41
氨气 (Ammonia)	NH <sub>3</sub>	17.03	1.31	氢 (Hydrogen)	H <sub>2</sub>	2.02	1.41
氩 (Argon)	Ar	39.95	1.67	硫化氢 (Hydrogen sulfide)	H <sub>2</sub> S	34.08	1.32
丁二烯 (Butadiene)	C <sub>4</sub> H <sub>6</sub>	54.09	1.113	二氯二氟甲烷 (Dichloro difluoro methane)	CCl <sub>2</sub> F <sub>2</sub>	120.91	1.139
苯 (Benzene)	C <sub>6</sub> H <sub>6</sub>	78.12	1.12	甲烷 (Methane)	CH <sub>4</sub>	16.04	1.31
异丁烷 (iso-Butane)	iso-C <sub>4</sub> H <sub>10</sub> or CH(CH <sub>3</sub> ) <sub>3</sub>	58.12	1.10	乙醇 (Ethyl alcohol)	CH <sub>3</sub> OH or CH <sub>4</sub> O	32.04	1.20
正丁烷 (n-Butane)	n-C <sub>4</sub> H <sub>10</sub>	58.12	1.09	氯甲烷 (Methyl chloride)	CH <sub>3</sub> OH or CH <sub>4</sub> O	50.49	1.20
二硫化碳 (Carbon disulfide)	CS <sub>2</sub>	76.14	1.21	氮 (Nitrogen)	N <sub>2</sub>	28.01	1.40
二氧化碳 (Carbon dioxide)	CO <sub>2</sub>	44.01	1.29	一氧化二氮 (Nitrous oxide)	N <sub>2</sub> O	44.01	1.30
一氧化碳 (Carbon monoxide)	CO	28.01	1.40	正壬烷 (n-Nonane)	n-CH <sub>3</sub> (CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub> or C <sub>9</sub> H <sub>20</sub>	128.26	1.04
氯 (Chlorine)	Cl <sub>2</sub>	70.91	1.36	氧气 (Oxygen)	O <sub>2</sub>	32.00	1.40
环己烷 (Cyclohexane)	C <sub>6</sub> H <sub>12</sub>	84.16	1.09	正戊烷 (n-Pentane)	n-CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> CH <sub>3</sub> or C <sub>5</sub> H <sub>12</sub>	72.15	1.07
正癸烷 (n-Decane)	n-C <sub>10</sub> H <sub>22</sub>	142.29	1.03	丙烷 (n-Propane)	n-CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub> or C <sub>3</sub> H <sub>8</sub>	44.10	1.13
乙烷 (Ethane)	C <sub>2</sub> H <sub>6</sub>	30.07	1.19	水蒸气(蒸馏水, 纯水) (Water)	H <sub>2</sub> O	18.02	1.133
乙醇 (Ethyl alcohol)	C <sub>2</sub> H <sub>5</sub> OH or C <sub>2</sub> H <sub>6</sub> O	46.07	-	二氧化硫 (Sulfur dioxide)	SO <sub>2</sub> or O <sub>2</sub> S	64.06	1.29
乙烯 (Ethylene)	C <sub>2</sub> H <sub>4</sub>	28.05	1.24	甲苯 (Toluene)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub> or C <sub>7</sub> H <sub>8</sub>	92.15	1.09
氦 (Helium)	He	4.00	1.66	丙烯 (Propylene)	CH <sub>3</sub> CHCH <sub>2</sub> or C <sub>3</sub> H <sub>6</sub>	42.08	1.15
正庚烷 (n-Heptane)	n-CH <sub>3</sub> (CH <sub>2</sub> ) <sub>5</sub> CH <sub>3</sub> or C <sub>7</sub> H <sub>16</sub>	100.21	1.05	辛烷 (Octane)	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>6</sub> CH <sub>3</sub> or C <sub>8</sub> H <sub>18</sub>	114.00	1.05

表2. 对于背压的容量校正系数

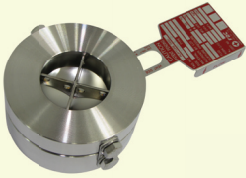
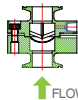
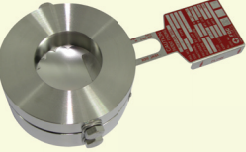



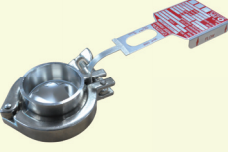
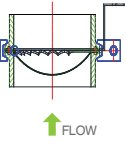
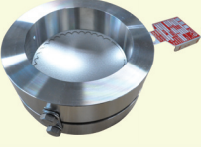





P <sub>b</sub> / P <sub>o</sub>	Isentropic exponent(k)																		
	0.4	0.5	0.6	0.7	0.8	0.9	1.001	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2
	Volume modification factor for back pressure																		
0.45																			
0.50																			
0.55																			
0.60																			
0.65																			
0.70																			
0.75																			
0.80	0.999	0.985	0.965	0.942	0.921	0.900	0.881	0.864	0.847	0.833	0.819	0.806	0.794	0.783	0.773	0.764	0.755	0.747	0.739
0.82	0.992	0.970	0.944	0.918	0.894	0.872	0.852	0.833	0.817	0.801	0.787	0.774	0.753	0.752	0.741	0.732	0.723	0.715	0.707
0.84	0.979	0.948	0.917	0.888	0.862	0.839	0.818	0.799	0.782	0.766	0.752	0.739	0.727	0.716	0.706	0.697	0.688	0.680	0.672
0.86	0.957	0.919	0.884	0.852	0.800	0.779	0.759	0.742	0.727	0.712	0.700	0.688	0.677	0.667	0.667	0.658	0.649	0.641	0.634
0.88	0.924	0.881	0.842	0.809	0.780	0.755	0.733	0.714	0.697	0.682	0.668	0.655	0.644	0.633	0.624	0.615	0.606	0.599	0.592
0.90	0.880	0.831	0.791	0.757	0.728	0.703	0.681	0.662	0.645	0.631	0.617	0.605	0.594	0.584	0.575	0.566	0.558	0.551	0.544
0.92	0.820	0.769	0.727	0.693	0.664	0.640	0.619	0.601	0.585	0.571	0.559	0.547	0.537	0.527	0.519	0.511	0.504	0.497	0.490
0.94	0.739	0.687	0.647	0.614	0.587	0.565	0.545	0.528	0.514	0.501	0.489	0.479	0.470	0.461	0.453	0.446	0.440	0.434	0.428
0.96	0.628	0.579	0.542	0.513	0.489	0.469	0.452	0.438	0.425	0.414	0.404	0.395	0.387	0.380	0.373	0.367	0.362	0.357	0.352
0.98	0.426	0.422	0.393	0.371	0.353	0.337	0.325	0.314	0.305	0.296	0.289	0.282	0.277	0.271	0.266	0.262	0.258	0.254	0.251
1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

表3. 根据粘度的容量校正系数











# PRODUCTS LIST

## RUPTURE DISC

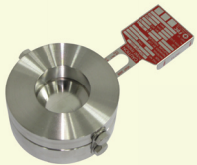
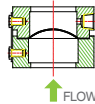
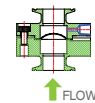
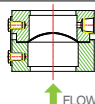
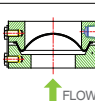
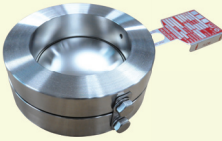
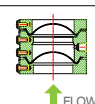
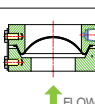
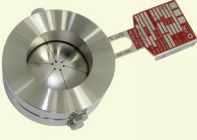
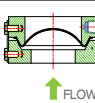
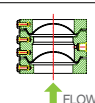

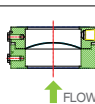
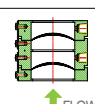
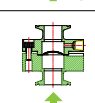
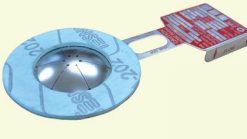
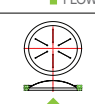
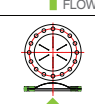

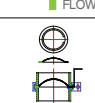
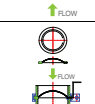

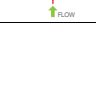

Model (Image)	Description	Holder or Connection Type	Drawing
<b>KSRR</b> 	Reverse Dome Knife Type	<b>KS</b> Insert Flat Seat Knife Blades Single Type	 ↑ FLOW
		<b>KD</b> Insert Flat Seat Knife Blades Double Type	 ↑ FLOW
		<b>BK</b> Bolted Flat Seat Knife Blades Single Type	 ↑ FLOW
<b>KSRRK</b> 	Reverse Dome Shear Type	<b>FS</b> Insert Flat Seat Single Type	 ↑ FLOW
		<b>FD</b> Insert Flat Seat Double Type	 ↑ FLOW
		<b>BF</b> Bolted Flat Seat Single Type	 ↑ FLOW
<b>KSRRKF</b> 	Reverse Dome Shear Type for Ferrule	<b>FERRULE</b> Ferrule Connection Type	 ↑ FLOW
<b>KSRBKH</b> 	Reverse Dome Buckling Knife Type	<b>BFS</b> Insert Flat Seat Single Type for RBK	 ↑ FLOW
		<b>BBF</b> Bolted Flat Seat Single Type for RBK	 ↑ FLOW
<b>KSRBK</b> 	Reverse Dome Buckling Knife Type for Flange	<b>RF</b> Flat Face Flange Type	 ↑ FLOW
		<b>FF</b> Raised Face Flange Type	 ↑ FLOW
<b>KRSR</b> 	Reverse Dome Scored Type	<b>FS</b> Insert Flat Seat Single Type	 ↑ FLOW
		<b>BF</b> Bolted Flat Seat Single Type	 ↑ FLOW

REVERSE TYPE



Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
							
1/2" ~ 48" (15A ~ 1200A)	0.3 ~ 150 kg/cm <sup>2</sup>	No	Yes	No	Yes	No	90%
1/4" ~ 4" (8A ~ 100A)							
1/2" ~ 24" (15A ~ 600A)	0.35 ~ 30 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 4" (8A ~ 100A)							
1S~4S FERRULE	0.35 ~ 30 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/2" ~ 36" (15A ~ 900A)	0.1 ~ 50 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 4" (8A ~ 100A)							
1/2" ~ 36" (15A ~ 900A)	0.1 ~ 50 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/2" ~ 12" (15A ~ 300A)	5 ~ 60 kg/cm <sup>2</sup>	No	Yes	No	No	No	90%
1/4" ~ 4" (8A ~ 100A)							

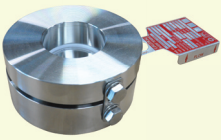
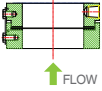






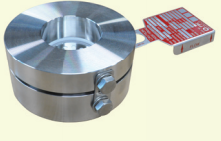
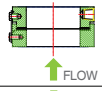




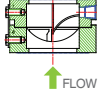
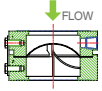
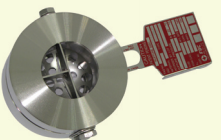
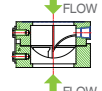
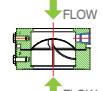
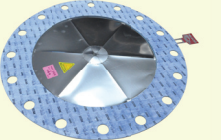


# PRODUCTS LIST









RUPTURE DISC				
	Model (Image)	Description	Holder or Connection Type	Drawing
FORWARD TYPE		Forward Dome Scored Type	FS	
			Insert Flat Seat Single Type	
	KSRST	Forward Dome Tension Flat Seat Type	FS	
	Insert Flat Seat Single Type			
		Forward Dome Tension Sloped Seat Type	SS	
			Insert Sloped Seat Single Type	
COMPOSITE DOME TYPE		Composite Dome Sloped Seat Type	SS	
			Insert Sloped Seat Single Type	
		Composite Dome Flat Seat Type	SD	
			Insert Sloped Seat Double Type	
			FS	
		Composite Dome Flat Seat Type for Flange	FD	
			Insert Flat Seat Double Type	
		Composite Dome Flat Seat Type for Ferrule	RF	
			Raised Face Flange Type	
		Composite Dome Flat Seat Double Acting Type for Ferrule	FF	
			Flat Face Flange Type	

Size	Set. Pressure		Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
				Gas or Vapor	Liquid			
1/2" ~ 12" (15A ~ 300A)	5 ~ 700 kg/cm <sup>2</sup>		No	Yes	Yes	No	No	80%
1/4" ~ 4" (8A ~ 100A)								
1/2" ~ 48" (15A ~ 1200A)	15 ~ 1500 kg/cm <sup>2</sup>		No	Yes	Yes	Yes	Yes	70%
1/2" ~ 40" (15A ~ 1000A)	15 ~ 1500 kg/cm <sup>2</sup>		No	Yes	Yes	Yes	Yes	70%
1/2" ~ 40" (15A ~ 1000A)	Teflon Seal	Metal Seal	Yes	Yes	Yes	No	No	80%
	0.1 ~ 30 kg/cm <sup>2</sup>	1.0 ~ 560 kg/cm <sup>2</sup>						
1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 50 kg/cm <sup>2</sup>		Yes	Yes	Yes	No	No	80%
1/4" ~ 4" (8A ~ 100A)								
1/2" ~ 52" (15A ~ 1300A)	0.05 ~ 50 kg/cm <sup>2</sup>		Yes	Yes	Yes	No	No	80%
1S~4S FERRULE	0.3 ~ 100 kg/cm <sup>2</sup>		Yes	Yes	Yes	No	No	80%
1S~4S FERRULE	0.3 ~ 100 kg/cm <sup>2</sup>		Yes	Yes	Yes	No	No	80%


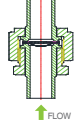
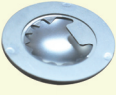
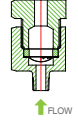
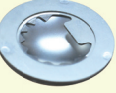
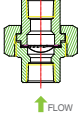

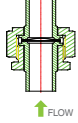
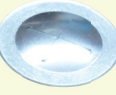
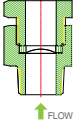
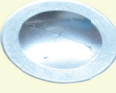
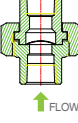

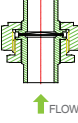

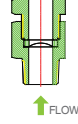

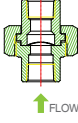

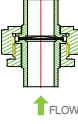
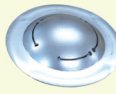
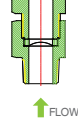
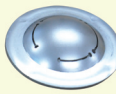
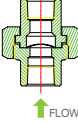
# PRODUCTS LIST

## RUPTURE DISC









	Model (Image)	Description	Holder or Connection Type	Drawing
COMPOSITE FLAT TYPE		Composite Flat Type	<b>H</b> Insert Flat Seat Single Type for RO	
			<b>B</b> Bolted Flat Seat Single Type for RO	
		Composite Flat Type for Flange	<b>RF</b> Raised Face Flange Type	
			<b>FF</b> Flat Face Flange Type	
		Composite Flat Type for Ferrule	<b>FERRULE</b> Ferrule Connection Type	
		Composite Flat Double Acting Type	<b>H</b> Insert Flat Seat Single Type for RO	
			<b>B</b> Bolted Flat Seat Single Type for RO	
		Composite Flat Double Acting Type for Ferrule	<b>FERRULE</b> Ferrule Connection Type	
ULTRA LOW PRESSURE TYPE		Reverse Dome Knife Type - LP	<b>LS</b> Insert Flat Seat Single Type for RRL & RRLD	
			<b>LVS</b> Insert Flat Seat Single Type for RRL & RRLD(Vacuum)	
		Reverse Dome Knife Double Acting Type - LP	<b>LS</b> Insert Flat Seat Single Type for RRL & RRLD	
			<b>LVS</b> Insert Flat Seat Single Type for RRL & RRLD(Vacuum)	
		Composite Flat Type for Flange - LP	<b>RF</b> Raised Face Flange Type	
			<b>FF</b> Flat Face Flange Type	

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
							
1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 35 kg/cm <sup>2</sup>	Yes	Yes	No	No	No	50%
1/4" ~ 4" (8A ~ 100A)							
1/2" ~ 72" (15A ~ 1800A)	0.3 ~ 35 kg/cm <sup>2</sup>	Yes	Yes	No	No	No	50%
1S~4S FREEULE	0.05 ~ 15 kg/cm <sup>2</sup>	Yes	Yes	No	No	No	50%
1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 15 kg/cm <sup>2</sup>	Yes	Yes	No	No	No	50%
1/4" ~ 4" (8A ~ 100A)							
1S~4S FREEULE	0.05 ~ 15 kg/cm <sup>2</sup>	Yes	Yes	No	No	No	50%
2" ~ 10" (50A ~ 250A)	0.01 ~ 0.15 kg/cm <sup>2</sup> (100 ~ 1500 mmAq)	Yes	Yes	No	No	No	50%
2" ~ 10" (50A ~ 250A)	0.01 ~ 0.15 kg/cm <sup>2</sup> (100 ~ 1500 mmAq)	Yes	Yes	No	No	No	50%
4" ~ 32" (100A ~ 800A)	0.01 ~ 0.15 kg/cm <sup>2</sup> (100 ~ 1500 mmAq)	Yes	Yes	No	No	No	50%


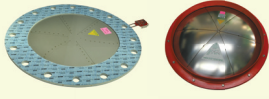

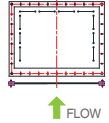
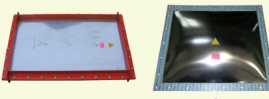
# PRODUCTS LIST


RUPTURE DISC			
Model (Image)	Description	Connection Type	Drawing
<b>KSRRKV</b> 	Reverse Dome Shear Type for VCR	<b>VCR</b>	
		VCR Connection Type	
<b>KSRRKP</b> 	Reverse Dome Shear Type for PLUG	<b>PLUG</b>	
		PLUG Connection Type	
<b>KSRRKU</b> 	Reverse Dome Shear Type for UNION	<b>UNION</b>	
		UNION Connection Type	
<b>KSRSFV</b> 	Forward Dome Scored Type for VCR	<b>VCR</b>	
		VCR Connection Type	
<b>KSRSFP</b> 	Forward Dome Scored Type for PLUG	<b>PLUG</b>	
		PLUG Connection Type	
<b>KSRSFU</b> 	Forward Dome Scored Type for UNION	<b>UNION</b>	
		UNION Connection Type	
<b>KSRSTV</b> 	Forward Dome Tension Type for VCR	<b>VCR</b>	
		VCR Connection Type	
<b>KSRSTP</b> 	Forward Dome Tension Type for PLUG	<b>PLUG</b>	
		PLUG Connection Type	
<b>KSRSTU</b> 	Forward Dome Tension Type for UNION	<b>UNION</b>	
		UNION Connection Type	
<b>KSRRCV</b> 	Composite Dome Flat Seat Type for PLUG	<b>VCR</b>	
		VCR Connection Type	
<b>KSRRCP</b> 	Composite Dome Flat Seat Type for UNION	<b>PLUG</b>	
		PLUG Connection Type	
<b>KSRRCU</b> 	Composite Dome Flat Seat Type for UNION	<b>UNION</b>	
		UNION Connection Type	

FITTING CONNECTION TYPE

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
							
1/4" ~ 1" (8A ~ 25A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 1" (8A ~ 25A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	No	No	90%
1/4" ~ 1" (8A ~ 25A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	Yes	Yes	70%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	Yes	Yes	70%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	No	Yes	Yes	Yes	Yes	70%
1/4" ~ 1" (8A ~ 25A)	8 ~ 3500 kg/cm <sup>2</sup>	Yes	Yes	Yes	No	No	80%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	Yes	Yes	Yes	No	No	80%
1/4" ~ 1" (8A ~ 50A)	8 ~ 3500 kg/cm <sup>2</sup>	Yes	Yes	Yes	No	No	80%

# PRODUCTS LIST

EXPLOSION PANEL	Model (Image)	Description	Connection Type	Drawing
	KSRPR	Round Flat Type Round Dome Type	RF	
			FF	
	KSRPS	Rectangular Flat Type Rectangular Dome Type	FF	
	FF			

EMERGENCY RELIEF HATCH	Model (Image)	Description	Connection Type	Drawing
	KSRH		Rupture Rod & Seal Type	Standard Flange

N <sub>2</sub> BLANKETING SYSTEM	Model (Image)	Description	Connection Type	Drawing
	KSBKL	Single Operating Type	Standard Flange or Screwed Piping	
				
	KSBKT	Pilot Operating Type	Standard Flange or Screwed Piping	
	Pilot Operating Type	Standard Flange or Screwed Piping		



Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
Max. Ø3600	0.01 ~ 0.5 kg/cm <sup>2</sup> (100 ~ 5000 mmAq)	Yes	Yes	No	No	No	50%
1500 X 2000 mm	0.01 ~ 0.5 kg/cm <sup>2</sup> (100 ~ 5000 mmAq)	Yes	Yes	No	No	No	50%

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
18" ~ 36" (450A ~ 900A)	150 ~ 5000 mmAq	N/A	Yes	N/A	N/A	N/A	N/A

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
1/2" ~ 2"	12.5 ~ 8000 mmAq	N/A	Yes	No	N/A	N/A	N/A
1/2" ~ 2"	20 ~ 8000 mmAq	N/A	Yes	No	N/A	N/A	N/A
1" ~ 2"	20 ~ 8000 mmAq	N/A	Yes	No	N/A	N/A	N/A



# REVERSE TYPE



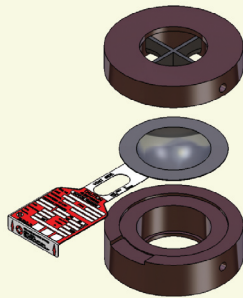
KSRR



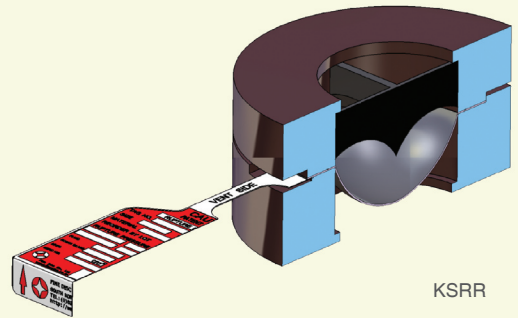
KSRR

## KSRR (Reverse Dome Knife Type)

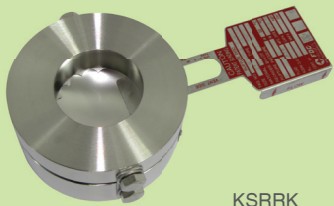
- Dome反转并且因附在上部Holder上的Knife Blade而破裂的反转型构造
- FDC设计在标准Holder上使用
- 有利于逆压, 真空, 脉动
- 不需Vacuum Support



KSRR



KSRR



KSRRK



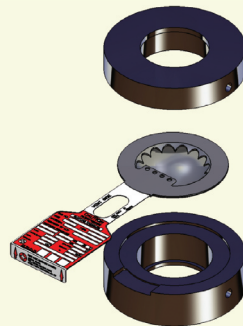
KSRRK

## KSRRK (Reverse Dome Shear Type)

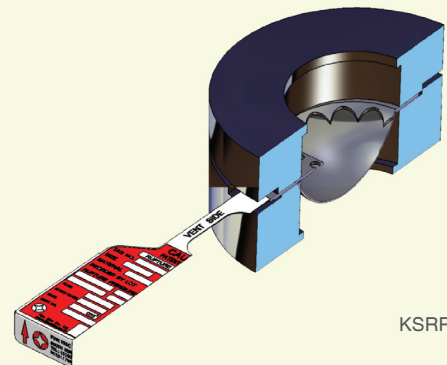
- Dome反转并且因附在Disc上的Knife Ring而破裂的反拱形构造
- FDC设计在标准Holder上使用
- Disc和Knife 一体型
- 比KSRR容易操作
- 有利于逆压, 真空, 脉动
- 不需Vacuum Support

## KSRRKF (Reverse Dome Shear Type for Ferrule)

- 虽然与KSRRK 模型同一, 但不需另外的 Holder, 可设计在Connection使用



KSRRK



KSRRK



KSRBKH

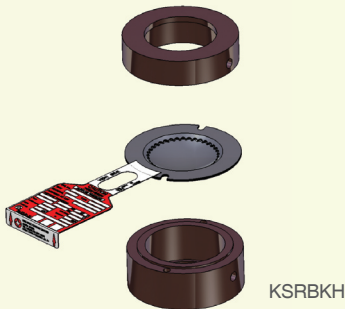
KSRBKH

**KSRBKH (Reverse Dome Buckling Knife Type)**

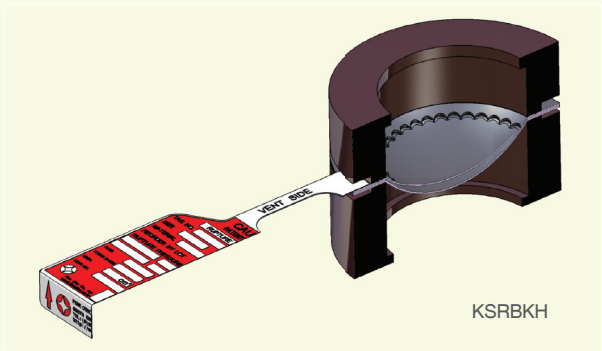
- Dome被Control Disc的Knife切断而破裂
- FDC设计在标准Holder上使用
- 以Control Disc和Seal Disc构成
- 因耐冲击所以容易操作
- 精密的破裂功能和优秀的信赖性
- 有利于逆压, 真空, 脉动
- 不需Vacuum Support

**KSRBK (Reverse Dome Buckling Knife Type for Flange)**

- 虽然与KSRBKH 模型同一, 但不需另外的Holder, 可设计在Flange使用



KSRBKH



KSRBKH

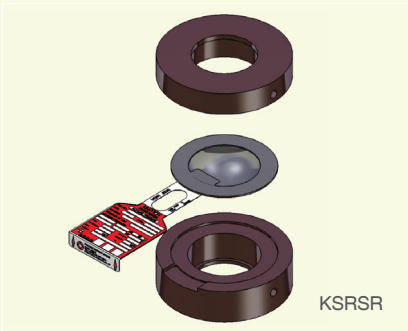


KRSR

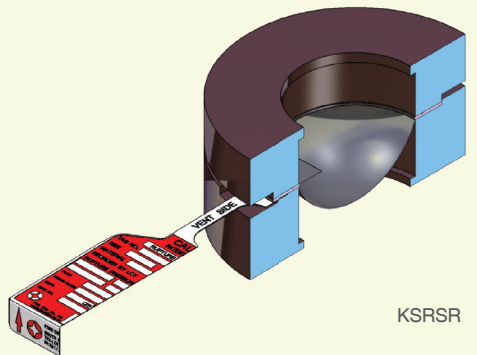
KRSR

**KRSR (Reverse Dome Scored Type)**

- 随精密加工的Scored Line反转而破裂的刀疤雕结构
- FDC设计在标准Holder上使用
- 主要适用于中压/高压
- 有利于逆压, 真空, 脉动
- 不需Vacuum Support



KRSR



KRSR

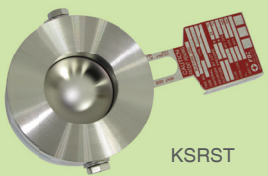
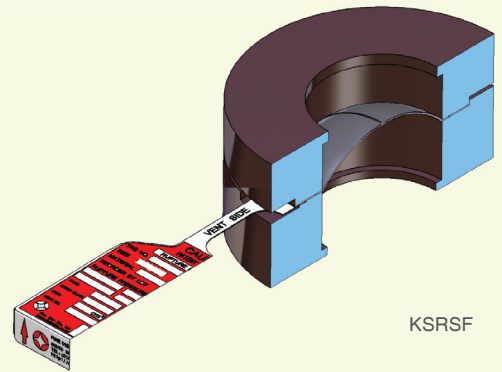
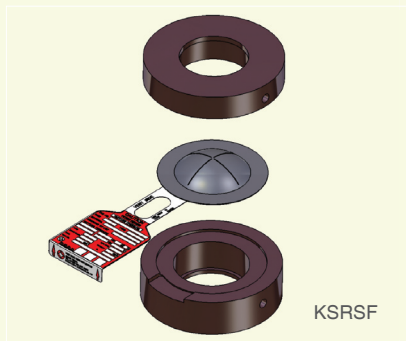


# FORWARD TYPE



## KSRSF (Forward Dome Scored Type)

- 精密加工的Scored Damage因Tension破裂的刀疤雕结构
- FDC设计在标准Holder上使用
- 主要适用于高压
- 有利于逆压, 真空, 脉动
- 不需Vacuum Support

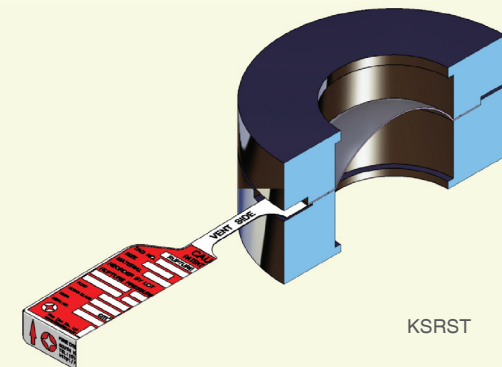
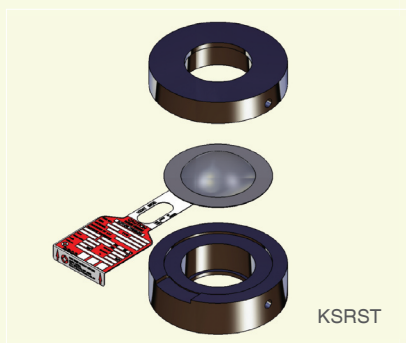


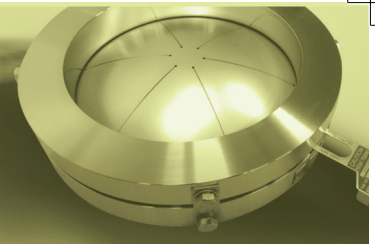
## KSRST (Forward Dome Tension Flat Seat Type)

- Disc因压力的作用被Tension破裂的构造
- FDC设计在标准Holder上使用
- 精密的破裂功能和优秀的信赖性
- 主要适用于高压, 超高压

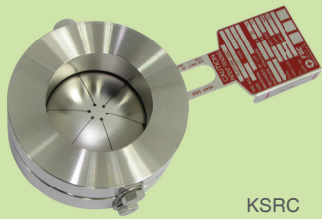
## KSRCT (Forward Dome Tension Sloped Seat Type)

- 与KSRST 模型同一, Disc Seat构造为Sloped Type
- 以Top Disc和支持Disc, Guide Ring构成
- 适合于逆压, 脉动条件





# COMPOSITE DOME TYPE



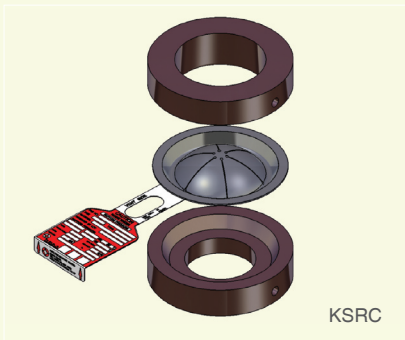
KSRC



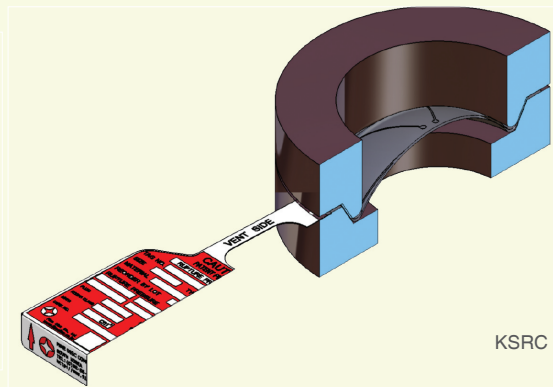
KSRC

## KSRC (Composite Dome Sloped Seat Type)

- 因Top Disc加工的Slit部分而破裂的复合型 / 拱顶型
- FDC设计在标准Holder上使用
- 以Top Disc 和Seal Disc, Vacuum Disc构成
- 适合于Liquid 或Steam Media环境
- 用Seal Disc材质使用Teflon的情况弱于高温
- 有利于逆压, 真空, 脉动
- 必要时可以适用Vacuum Support



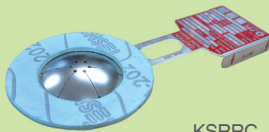
KSRC



KSRC



KSRRCH



KSRRC



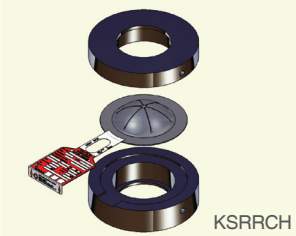
KSRRCF



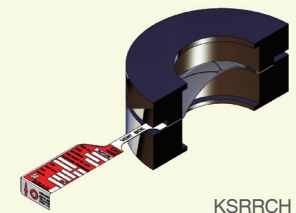
KSRRCFD

## KSRRCH (Composite Dome Flat Seat Type)

- 因Top Disc加工的Slit部分而破裂的复合型 / 拱顶型
- FDC设计在标准Holder上使用
- 以Top Disc和Seal Disc, Vacuum Disc构成
- 适合于Liquid 或Steam Media环境
- 用Seal Disc材质使用Teflon的情况弱于高温
- 有利于逆压, 真空, 脉动
- 必要时可以适用Vacuum Support



KSRRCH



KSRRCH

## KSRRC (Composite Dome Flat Seat Type for Flange)

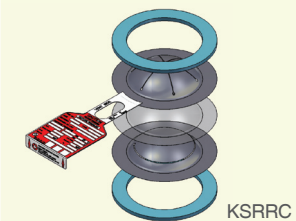
- 与KSRRCH 模型同一, 不需另外的Hoder, 可设计在Flange使用

## KSRRCF (Composite Dome Flat Seat Type for Ferrule)

- 与KSRRCH 模型同一, 不需另外的Hoder, 可设计在Ferrule Connection使用

## KSRRCFD (Composite Dome Flat Seat Double Acting Type for Ferrule)

- 与KSRRCF 模型同一, 可将双方向的破裂压力不同设置



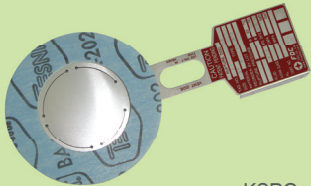
KSRRC



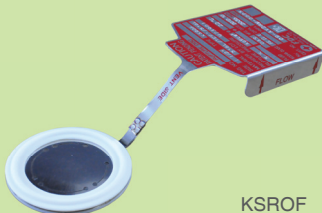
# COMPOSITE FLAT TYPE



KSROH



KSRO



KSROF



KSROHD



KSROFD

## KSROH (Composite Flat Type)

- 因Top Disc加工的Slit部分而破裂的复合型 / 平面型构造
- FDC设计在标准Holder上使用
- 以Top Disc和Seal Disc, Vacuum Disc构成
- 用Seal Disc材质使用Teflon的情况弱于高温
- 弱于脉动条件
- 必要时可以适用Vacuum Support

## KSRO (Composite Flat Type for Flange)

- 虽然与KSROH 模型同一, 不需另外的Hoder, 可设计在 Flange使用

## KSROF (Composite Flat Type for Ferrule)

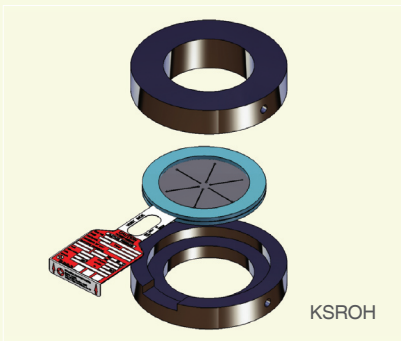
- 虽然与KSROH 模型同一, 不需另外的Hoder, 可设计在 Ferrule Connection使用

## KSROHD (Composite Flat Double Acting Type)

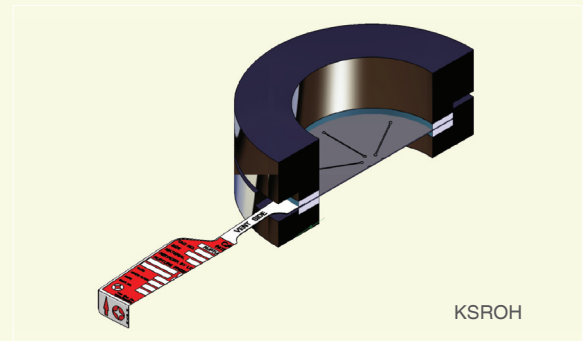
- 与KSROH 模型同一, 可将双方向的破裂压力不同设置

## KSROFD (Composite Flat Double Acting Type for Ferrule)

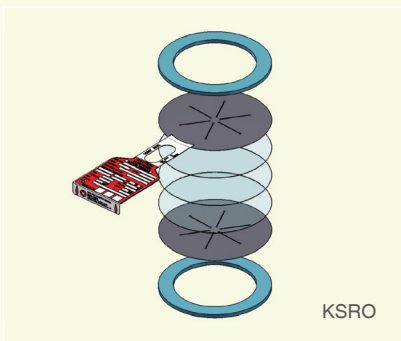
- 与KSROH 模型同一, 可将双方向的破裂压力异常设置



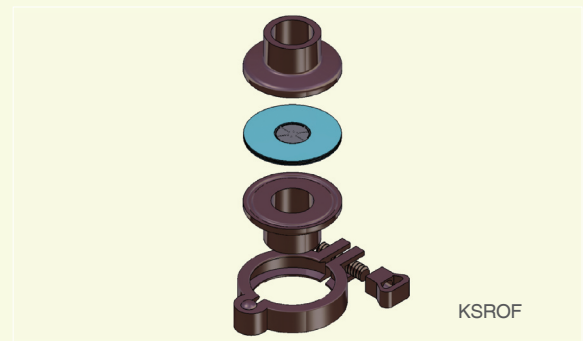
KSROH



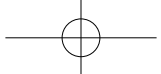
KSROH



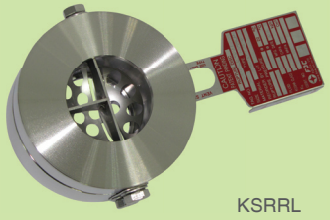
KSRO



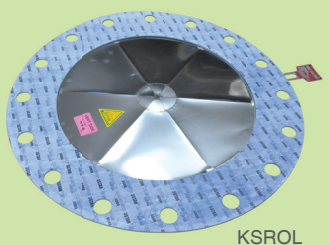
KSROF



# ULTRA LOW PRESSURE TYPE



KSRRL



KSRRLD

## KSRRL (Reverse Dome Knife Type - LP)

- 设置压力应使用最少为100mmAq的超微压
- Dome反转因上部Holder上的Knife BladeE而所以破裂的反转型构造
- FDC设计在标准Holder上使用
- 以Support Disc 和 Disc Seal, Vacuum Support构成

## KSRRLD (Reverse Dome Knife Double Acting Type - LP)

- 与KSRRL模型同一, 可将双方向的破裂压力不同设置

## KSRROL (Composite Flat Type for Flange - LP)

- 设置压力应使用最少为100mmAq的超微压
- 因Setting Disc加工的Slit部分而破裂的复合型 / 平面型构造
- 无需另外的Holder设置Flange后使用
- 以Top Disc, 和 Setting Disc, Seal Disc, Vacuum Support 构成
- 用Seal Disc材质使用Teflon的情况弱于高

# FITTING CONNECTION TYPE



VCR



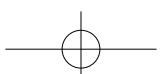
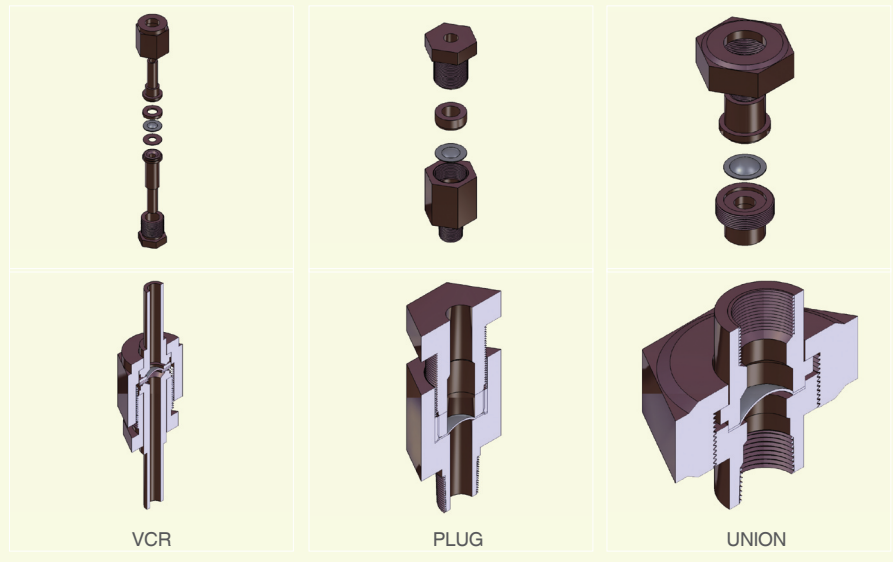
PLUG



UNION



- **KSRRKV / KSRRKP / KSRRKU** (Reverse Dome Shear Type for VCR/PLUG/UNION)  
- 因Top Disc加工的Slit部分而破裂的复合型 / 拱顶型构造
- **KSRSFV / KSRSFP / KSRSFU** (Forward Dome Scored Type for VCR/PLUG/UNION)  
- 将KSRSF模型使用于Fitting Connection
- **KSRSTV / KSRSTP / KSRSTU** (Forward Dome Tension Type for VCR/PLUG/UNION)  
- 将KSRSF模型使用于Fitting Connection
- **KSRRCV / KSRRCP / KSRRCU** (Composite Dome Shear Type for VCR/PLUG/UNION)  
- 将KSRSF模型使用于Fitting Connection





# ACCESSORY

<b>Pressure Gauge(P/G)</b>	压力计
<b>Pressure Switch(P/S)</b>	压力操纵开关
<b>Excess Flow Valve(E.F.V)</b>	为使在Rupture Disc和排出侧的安全阀之间维持待命状态的一种Check Valve
<b>Nipple, Tee, Plug, Reducer</b>	为设置P/G, P/S, E.F.V的Fitting
<b>Stud Bolt &amp; Nut</b>	In/Out Flange用于采取的Bolt&Nut
<b>Eye Bolt</b>	为操作重量品而设置在直径8inch以上的Holder上部
<b>Gasket</b>	In/Out Flange 结合面的Sealing
<b>J-Hook</b>	在下端Holder上设置'J'形状的钩子
<b>Jack Screw</b>	焊接在In/Out Flange上确保Rupture Disc设置空间 (用于维修)
<b>Sensor Disc</b>	为确认Rupture Disc是否破裂, 作为Sensor的Disc与Shield Cable一起供给 (Type - 一体型, 分离型)
<b>Junction Box</b>	连接于Sensor Disc的Shield Cable的Terminal Box
<b>Rain Hood</b>	设置在直接暴露在大气中Rupture Disc的上端, 而防止外部异物或雨水对Rupture Disc进行保护
<b>Heat Shield</b>	将如同Cerak Wool或Aerogel等断热材料设置在Rupture Disc前端, 起到减少约300~400°C以上高温的功能





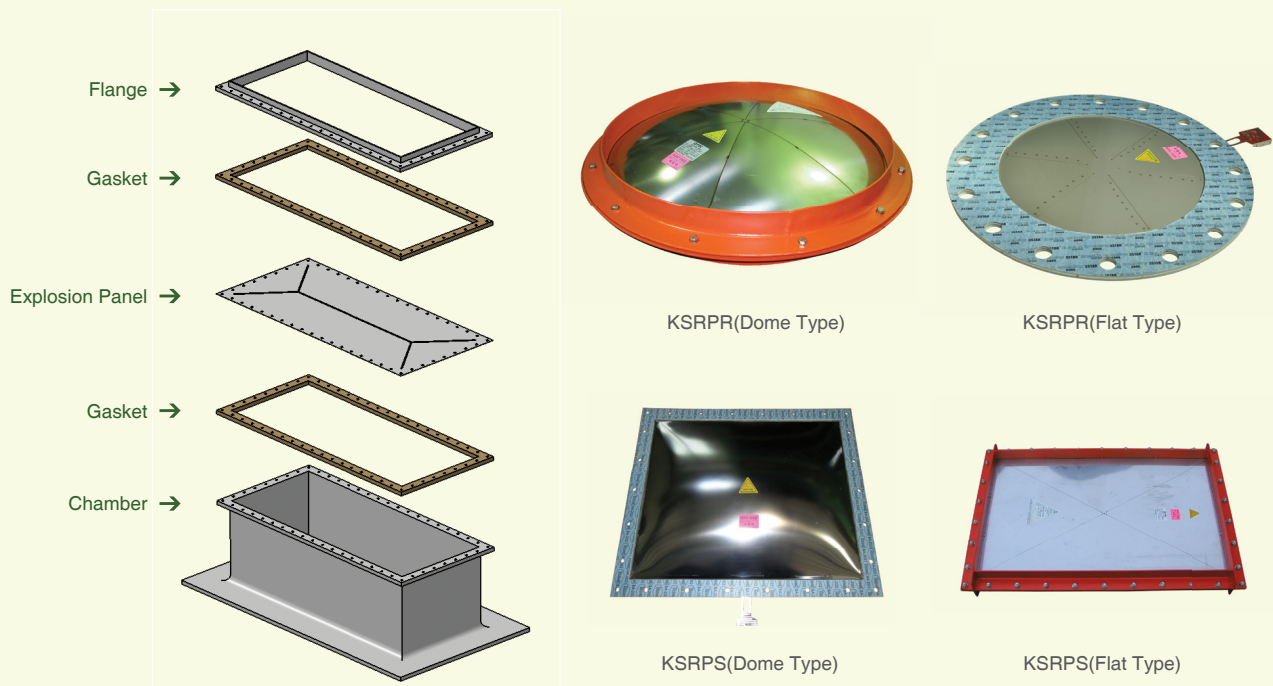
# EXPLOSION PANEL

## Explosion Panel 简介

- 气体(Gas), Powder, 粉尘, 其他混合物等因点火源的引火, 在扩散到爆炸之前的爆燃过程中将内部发生的压力和火焰瞬间放出而防止设备损伤的安全装置

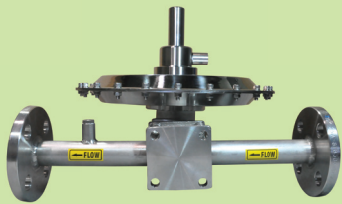
## Explosion Panel 特征

- 适用设备 : Silo, Bag Filter, RTO, Bucket Elevator, Duct, Hopper, etc
- 使用流体 : Dust, Gas, Powder, Mixture
- Code : NFPA 68, KOSHA Code
- 优点
  - 在低压里及时的操作减少压力
  - 为将因膨胀的气体(Gas)而引起的损伤变为最小化而快速泄放
  - 防止泄露及不发生破片的设计
  - 简单的更换作业及低廉的维修费用
  - 根据容器的尺寸和所装物质的种类可任意选定产品的数量及设置位置

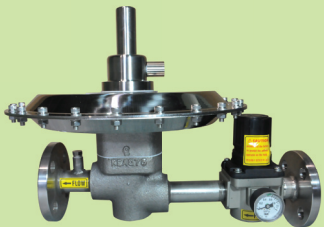




# N2 BLANKETING SYSTEM



KSBKL



KSBKT



KSBKS

## N2 Blanketing System (填充氮的装置)的定义

- 往Tank的上端空间里填充惰性气体N2 Gas, 因此维持一定压力状态的调节装置

## N2 Gas 的功能

- 将Tank内Vapor的形成变为最小化, 从而减少产品蒸发损失
- 抑制Tank内Vapor空间里发生氧气等有害气体成分的发生并消除爆炸因素
- 切断从外部引入不必要的湿气, 空气从而防止产品的损伤
- 抑制因静电而发生的Spark并防止爆炸
- 缩短产品Discharging时间从而提高产品调动率
- 抑制Tank内的真空发生从而防止Tank变形

## Type

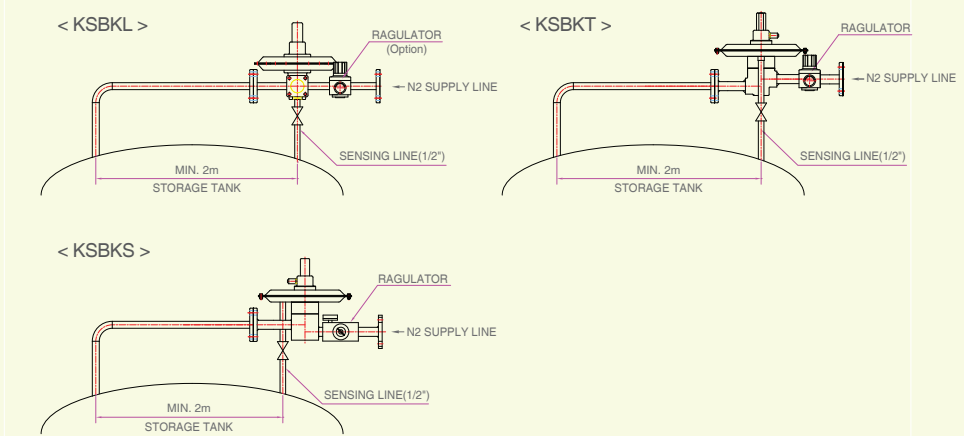
- KSBKL(小容量)
- KSBKT(大容量)
- KSBKS(超大容量)

## Flow Capacity (额定流量)

[单位: Nm<sup>3</sup>/h]

Model	Inlet Pressure						
	1 barg	2 barg	3 barg	4 barg	5 barg	6 barg	7 barg
KSBKL	64.7	105.2	145.2	184.7	223.6	262	299.8
KSBKT	240.6	367.4	493.6	493.6	744.6	869.4	993.9
KSBKS	871.3	1316.9	1650.9	1891.8	2058	2168	2240.3

## 设置 - Layout



# EMERGENCY RELIEF HATCH - KSRH

## EMERGENCY RELIEF HATCH - KSRH

- 因储藏容器内部的压力增加, 从而发生允许运转压力以上的超压时, Tension Rod破裂, 开起Cover, 并且将内部压力向外排出的装置
- 与一般Emergency Venting Device不同, 根据Tension Rod将所需压力Setting, 因使用Sealing Diaphragm, 所以, 比现使用的Weight Type, Oil Seal Type, Spring Type 等Setting能力更优秀
- Oil Seal Type的情况因根据温度变化而引起的Oil的粘度差异, 从而使Setting Pressure发生不一致情况, 所以导致信赖度减少, 但本装置利用Tension Rod特性, 因此对于Setting Pressure的信赖度很高

## 特征

- 因Sealing功能优秀, 因此, 不会发生Leakage
- 内藏有用于Sealing的Diaphragm
- 主要适用于LNG船舶, 用于路上的Tank等
- 因使用特殊设计的Tension Rod, 因此, 可提高对于Setting Pressure的信赖度
- 可进行低压的Setting
- 破裂后只更换部分部件也可重新Setting, 因此, 维持保修费用低廉



# FDC NETWORK



## 首尔 Agent

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