Rupture Discs ● Explosion Panels ● Customised Innovation

Relieving the pressure and supporting risk reduction in the Oil & Gas Sector
## Oil & Gas Industry

### Upstream

<table>
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<th>Application</th>
<th>Description</th>
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| Exploration and production               | - Drilling and casing protection  
- Gas coolers & Heat exchangers  
- De-oilers  
- Mechanical seals and pump protection  
- Sulphur recovery units  
- Sampling loops  
- Knock out drums  
- Shale Gas |
| Storage & Transportation                 | - Pipeline maintenance and protection |

### Downstream

<table>
<thead>
<tr>
<th>Application</th>
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</table>
| Processing                               | - Flare stacks  
- Separation towers |
| Distribution                             | - Transportation |
Elfab products are certified to ISO/TS 29001:2010, which defines the quality management system for product and service supply into the petroleum, petrochemical and natural gas industries. Elfab is unique in its rigorous conformance to engineering, user and regulatory requirements within the Oil & Gas sector.
Application: Drilling & Casing Protection

Rupture disc devices are used throughout the entire oil and gas production process. In drilling applications, they are commonly used for both pressure activation and pressure relief.

Downhole pressure activation

Using controlled pump pressure, rupture discs can be operated to facilitate fracture and assist the drilling process.

Overpressure protection

In some applications, a rupture disc may be used as a protection device to prevent a vessel from overpressurisation.

Specially designed welded bursting discs can protect the casing of the drill from overpressurisation, which can be caused by blockage of cooling liquid nozzles or cement dispensers.

Whether its Onshore or Subsea, for pressure activation or pressure relief, Elfab can work with you to develop a pressure management solution to match your exact requirements.

Recommended products

Elfab’s Custom Engineered rupture disc are uniquely manufactured for each application to meet individual customer requirements.
Application: Gas Coolers and Heat Exchangers

Rupture discs (or burst discs) act as primary valve isolation or secondary pressure relief devices within shell and tube gas coolers and heat exchangers.

The device is often used on the sea water side (shell side) containing high pressure which is either heated or cooled by a low pressure utility fluid. The rupture disc offers overpressure protection at a much greater speed than traditionally offered by a safety relief valve. When the disc bursts, the pressure is immediately released to avoid costly explosions.

The integral magnetic detection system available with Elfab’s rupture disc range initiates an instant alarm signal to identify that there has been a burst. This ensures that the integrity of other parts of the system are not compromised and the system can be reset.

Recommended products

Opti-Gard™ high performance reverse-acting rupture disc

- Withstands high levels of back pressure
- Suitable for gas, liquid and vapour applications

NORSOK approved materials

Flo-Tel+™ Technology
Integral, reusable, non-invasive ATEX, IECEx or Exd burst detection
Application: De-Oilers

During the Oil and Gas production process, the produced fluids are separated into individual components and either discarded or sold on. The separation of oil, gas and water is achieved largely by gravity, as the lighter gas is removed from the top of the separator towers and the water drained from the bottom, leaving the oil to be collected.

Separators like de-oilers can often experience overpressure, sometimes leading to catastrophic events and severe damage to plant infrastructure. Furthermore human life may be at risk, making the consideration of pressure relief devices essential within this environment.

Rupture discs or bursting discs help to regulate the flow of separated liquids and relieve the excess pressure when required.

As an accurate and reliable solution, rupture discs can be used as primary relief, secondary relief, or in combination with a traditional safety valve for optimal protection.

Recommended products

Opti-Gard™ high performance reverse-acting rupture disc

- Industry-leading 3% tolerance
- Full vacuum capability without additional vacuum support

Flo-Tel™ Technology
Integral, reusable, non-invasive ATEX, IECEx or Exd burst detection
Application: Flare Stacks

Flare stacks are used to eliminate waste gas where it is not feasible to use it or transport it away from the gas processing system.

Rupture discs or bursting discs protect the equipment from explosion as a result of becoming being over pressurised. If the pressure in the gas recovery system rises, the rupture disc will burst first, re-establishing the path to the flare which is ignited to burn the waste gas.

As an accurate and reliable solution, rupture discs can be used as primary relief, secondary relief, or in combination with a traditional safety valve for optimal protection.

Double rupture disc assemblies (back to back arrangements) are also a common solution where failures of the initial disc may occur. In this case, the second disc is reversed to withstand the initial shock pressure.

In some applications, the rupture disc can be installed in parallel to the safety relief valve to provide a direct path to the flare in case the mechanical valve should fail to open.

Recommended products

Opti-Gard™ high performance reverse-acting rupture disc

- Available in a wide range of materials
- Excellent resistance against corrosion
Application: Knock-Out Drums

In most industrial plants, there is a vapour-liquid separator, or knockout drum, upstream of the flare to remove any liquid that may accompany the relieved gases. Rupture discs protect knockout drums from being over pressured.

As an accurate and reliable solution, rupture discs can be used as primary relief, secondary relief, or in combination with a traditional safety valve for optimal protection.

Double rupture discs (back to back arrangements) are also a common solution where failures of the initial disc may occur. In this case, the second disc is reversed to withstand the initial shock pressure.

In some applications, the rupture disc can be installed in parallel to the safety relief valve to provide a direct path to the flare in case the mechanical valve should fail to open.

Recommended products

Opti-Gard™ high performance reverse-acting rupture disc

- Tested to one million life cycles
- Available in a wide range of materials

Flo-Tel+™ Technology
Integral, reusable, non-invasive ATEX, IECEx or Exd burst detection

NORSOK approved materials
**Application:**

**Sulphur Recovery Unit**

Sulfur is a product of the refining process widely used in:

- wastewater treatment
- car batteries
- nylon production
- hydrochloric acid production... and many more

CO2 recovery units are an integral parts of an FPSO system.

**Sulfur Recovery Units**

During the recovery of sulphur in most modern refineries high temperatures and pressures coupled with back pressures and potential pipe blockages can lead to catastrophic damage to plant equipment and personnel.

Elfab has worked with many industry leaders to provide a low maintenance solution to this issue.

Rupture discs are now widely used as protection against overpressurisation during this sulphur recovery process.

**Recommended products**

**Opti-Gard™ high performance reverse-acting rupture disc**

- Full vacuum capability without additional vacuum support
- Withstands high levels of back pressure
- Excellent corrosion resistance
- Suitable for liquid, gas and vapour applications

**Flo-Tel+™ Technology**

Integral, reusable, non-invasive ATEX, IECEx or Exd burst detection

**NORSOK approved materials**
Industrial containers like intermodal tanks and railcars often need a reliable overpressure solution as protection during the transportation of hazardous liquids or gases. Where there is a risk of over pressurisation the disc ruptures and prevents the vessel exploding.

Rupture discs can be used in combination with safety relief valves, either in parallel or in series.

Using a rupture disc in addition to a valve offers the unique advantages of each individual solution, whilst maintaining a reasonable cost.

The rupture disc extends valve life by isolating corrosive fluids from internal valve parts. Having a full lining to the process side, Elfab’s ICD disc prevents contact between the metal disc and the corrosive media; this extends the system life even further.

**Recommended products**

**Tank-Safe**
- No holder required
- Full bore relief
- Available in a range of standard sizes, pressures and corrosion-resistant materials

**Intermodal Container Disc**
- Fully lined on the process side, preventing contact between metal and corrosive media.
- Up to 90% operating to burst pressure ratio combined with ±5% burst tolerance
- Complete with inlet and outlet gasket
Common Configurations

Rupture Disc as Primary Pressure Relief

Single Rupture Disc

![Basic pressure relief – Process must be reset following a burst](image1)

Double Disc Assembly

![Used where there is very high back pressures on the non-process side.](image2)

Rupture Disc as Secondary Pressure Relief

To overcome issues experienced with use of a single relief valve, it is becoming increasingly common to see a rupture disc and safety valve in combination to benefit from the unique advantages of each individual solution, whilst maintaining a reasonable cost.

As secondary protection, rupture discs also offer a back-up in case of downtime and can enhance the SIL level of the system by adding layers of protection.

In Parallel

In the first instance, the relief valve vents the pressure as required. Where this cannot be done successfully (due to fault or failure, blockage) and the pressure continues to rise, the rupture disc positioned alongside the valve offers a secondary relief path to avoid explosion.

Upstream

The use of rupture discs upstream of a safety relief valve can prevent valve blockages, minimise process leakage into the atmosphere and extend valve life by isolating corrosive fluids from internal valve parts.

The benefits of using rupture discs and relief valves in combination have led many users in high integrity industries like the Oil and Gas sector to implement one of the above configurations as their pressure relief solution.
Contact Us

Elfab not only offers some of the most technically advanced products on the market, it also leads the way in providing excellent customer service and industry-best lead times.

All Elfab manufacturing facilities and Head Office functions are located within its North Tyneside site. However, it does have several sales offices around the World, as well as a growing network of distribution partners.

Elfab’s fully trained multi-lingual customer support team is available to contact and will provide you with full technical assistance. To request more information on Elfab’s products and services, or if you would like a visit from one of our fully trained sales managers, we will be more than happy to help you:

Elfab Limited
Alder Road, North Shields
Tyne & Wear, NE29 8SD
UK
Tel: +44 (0)191 2931234
Fax: +44 (0)191 2931200
Email: sales@elfab.com

Elfab Limited Singapore
3 International Business Park, #01-18,
Nordic European Centre,
Singapore 609927
Tel: +65 65559130
Fax: +65 65559138
Email: singaporesales@elfab.com

Elfab Limited Poland
Atrium International, AL.
Jana Pawla II 23
00-854 Warszawa, Poland
Tel: +48 (22) 65 38 604
Email: sales@elfab.com

For reference lists and customer testimonials, please get in touch.