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Rupture Disks

RUPTURE DISK TECHNICAL AND APPLICATION INFORMATION

Rupture disks are metal disks that are designed to rupture within a specific pressure range to provide emergency pressure relief. They are common in extrusion, on pressure vessels and in a variety of other industries.

In polymer extrusion machinery, the rupture disk is permanently attached to an “extruder” body by silver solder or welding to produce a complete unit that can be inserted and removed from the extruder. This unit is typically called a burst plug, blow plug, or soft plug.

All “ECS” blow plugs have the following characteristics unless otherwise specified:

• 303 Stainless Body and Inconel Disk
• Made in USA
• All units factory tested to ASME standards
• Lot # marked on body for traceability to original factory testing (except -618 and resized models)
• +/- 5% accuracy of specified pressure range
• 70% non-diminishing usable range
• 900°F max operating temperature
• Minimum pressure of 1250 psi for standard construction. Ranges down to 800 psi can be special ordered, please call for details
• Hastelloy disk and bodies available for corrosive applications

Special orders available. Please call.

TESTING AND ACCURACY

All of our rupture disk ratings are based on ASME testing standards. A number of disks in each batch are blown at room temperature (72°F) to establish a baseline pressure and then derated to establish a value at a temperature that is more typical of extruder operating conditions. Each batch or lot is assigned a specific lot number to ensure traceability back to this testing.

Rupture disks are not precision devices. Using industry standard construction methods, rupture disks are designed to burst within +/- 5% of published pressure rating.

TEMPERATURE EFFECTS

The construction of our blow plugs is designed for operating temperatures up to a maximum of 900°F. The 900 degree limit is a limitation of the joining method used to mount the actual rupture disk on the body. All of our blow plugs can be used up to 900°F with minimal derating required.

The inconel disk provides very consistent pressure ratings over the temperature range of most polymer extrusion processes (300° - 750°F). In this range (300° - 750°F), the actual burst pressure is expected to remain within 1% of the +/- 5% range for our blow plugs which are rated at 550° or 600°F.
TEMPERATURE EFFECTS (CONTINUED)

**DISK SELECTION EXAMPLES**

1. Barrel rated at 10,000 psi
   - Normal operating pressure 3,000 psi at 400°F
   - $3000/0.7 = 4285$ psi minimum
   - Next closest std blow plug value is 5000 psi
   - Choose BP5000-XXX to give adequate protection and avoid premature failure due to fatigue.

2. Barrel rated at 10,000 psi
   - Normal operating pressure 8,000 psi at 450°F
   - $8000/0.7 = 11,428$ exceeding barrel rating
   - Choose BP10,000-XXX to stay within barrel rating. Expect diminished life of rupture disk.

**FATIGUE EFFECTS**

Our extruder rupture disks, as well as most sold, are designed for maximum life if pressure does not exceed 70% of rated value. Blow plugs run at greater than 70% of rated value will have reduced life due to metal fatigue of the disk.

**Three common issues lead to wasted $$$ in rupture disk purchases.**

- Having a small lot run at a particular temperature instead of buying a stock unit. (Ratings will vary by 1% or less of range at typical extruder temps)
- Operating pressures are in the upper 30% of pressure range (leads to metal fatigue and premature failure)
- Mounting holes are dirty, malformed, or poorly machined. (units are damaged before they even start to operate) See page 3.16 for cleaning tools, shims and spacers.