

## Backup Rings

Backup rings are made of a relatively hard material. They are installed in the gland between an O-ring (or an X-ring) and the low-pressure side of the seal to prevent the O-ring from being forced into the extrusion gap.

Backup rings are commonly used when an application operates under pressures exceeding 1,500 psig, or when components are designed with a relatively large extrusion gap through the gland. Backup rings enable slightly lower machining tolerances and increase the seal performance and seal life.

CTG supplies backup rings in different styles, including solid rings, split rings, and double (spiral) rings. We manufacture backup rings in any size, and in your choice of material.



*Typical backup ring with a split for easy installation*

## Design Considerations

When a mechanical system operates under mild conditions, an O-ring (or X-ring) in the system is compressed against the low-pressure side of its O-ring groove (gland) to form a seal. As temperature or pressure increases, the O-ring deforms increasingly out of round; and, if the temperature or pressure becomes sufficiently high, the O-ring starts to extrude into the tolerance gap between the two gland components. After this process of extrusion begins, the O-ring quickly erodes, and the seal might then fail.

A backup ring is designed to be installed in the gland on the low-pressure side of the O-ring, between the O-ring and the gland wall. During operation, the O-ring is compressed against the backup ring instead of the gland wall, and cannot seep into the tolerance gap because the backup ring completely closes the gap between the two gland components.



*O-ring extruding into tolerance gap*



*Backup ring positioned to prevent extrusion*

## Applications

- High temperature
- High pressure
- Glands with a relatively large tolerance gap
- Static or dynamic systems
- Corrosive environments

## Benefits

- A simple, inexpensive, and effective way to prevent seal failure by extrusion
- A wide variety of forms and sizes
- Readily fabricated from custom materials to meet the exact needs of the application
- Gland components can be machined to lower tolerances
- Reduces need for seal maintenance