



## Grout Containment Equipment

### Inflatable Grout Packers

Inflatable Grout Packers from Oil States MCS provide a fast, reliable, and robust seal between the ID of the pile sleeve or jacket leg and the OD of the pile. These packers have been used successfully on thousands of platform jackets for more than 30 years.

Oil States grout packers make single-stage grouting possible by providing a seal that is not limited by grout weight or water depth. Single-stage grouting makes the most efficient use of construction barge time

#### Features

- High-strength, nylon-reinforced packer seal element allows one-stage grouting regardless of water depth or grout weight.
- Regular guide shims above the packer protect it during pile driving and ensure pile centering for sealing.
- Complete quality assurance during manufacturing, including material traceability, radiographic weld inspection, and factory pressure testing
- Packers withstand pile-driving vibrations and shock loads.

- The packer seal element can be easily installed in a leg or sleeve at the fabrication yard.
- There is a wide range of options to meet customer specifications.

#### Operation

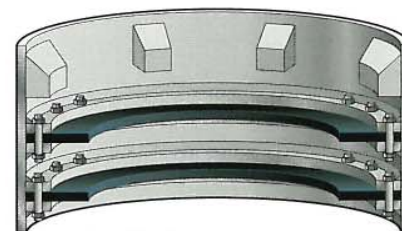
After the pile is driven, the grout packer inflation operation is initiated from the jacket work deck through stainless-steel tubing or subsea via ROV or diver connections. The inflatable seal is confirmed prior to grouting operations by use of pressure gauges located at the surface or on a subsea manifold.

#### Custom Designs

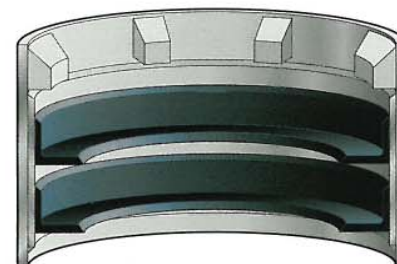
Oil States MCS is widely recognized for custom-designed grout packers for special applications. We have furnished packers up to 180 inches in diameter, packers that withstand inflation pressures up to 1400 psig, packers that accommodate cyclic inflation service, and packers that retain acceptable inflation pressure for as long as one year.



Inflatable Grout Packer with back-up Flat Seal



Dual Flat Seals



Dual Ell Seal



Bead-Type Wiper/Seal

### Passive Grout Seals

Oil States offers three types of passive (noninflated) grout seals for supporting grout plugs. They can be used as back-up seals to grout packers or stand-alone seals for smaller structures. They also are used to prevent mud contamination of the pile/sleeve annulus during pile driving if mud-barrier diaphragms were used to prevent initial mud intrusion. All the seals tolerate reverse pile movement. They are made of cast elastomer and are available for any pile and sleeve diameter.

**Flat Seals.** The Flat Seal is typically used as a back-up seal for an inflatable grout packer, since it requires a minimum, nominal jacket/pile annulus of 3 inches (76 mm). Dual Flat Seals can serve as a primary grout seal on smaller structures.

#### Ell and Dual Ell Seals.

The Ell grout seal fits in annuli as small as 1.5 inches (38 mm) but can also be used in large-annulus situations. Dual Ell seals support up to 25 feet of grout and are frequently used on jacket legs that are pressure-grouted.

**Bead-Type Wiper/Seal.** This seal is installed on the bottom of the pile sleeve, so it can be used with sleeve/pile annuli less than 1.5 inches (38 mm). Since it is welded onto the bottom of the pile sleeve, it can be installed during the final stages of fabrication.

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