



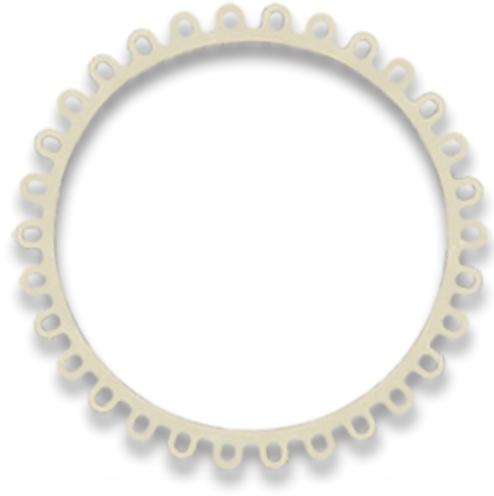
## VSP API 650 OPRA™

Engineered to seal API 650 manway flanges without warping or bending the flange

### API 650 OPRA

API 650 roof and shell manways are difficult to seal. Large gasket contact area prevents adequate compression of conventional full-face gaskets at max bolt. Flanges are also thin and prone to warping with ring gaskets due to a lack of flange support.

VSP's API 650 OPRA reduces the gasket contact area making necessary bolt stress attainable while still providing full flange support.



### Achieve Required Gasket Stress While Maintaining Full Flange Support and Bolt Integrity

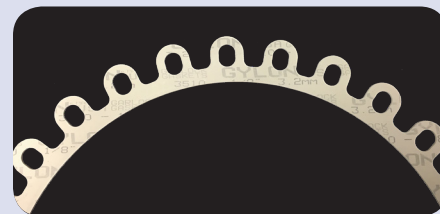
- ▶ Engineered full-face with reduced area
- ▶ Provides necessary flange support
- ▶ Generates greater than 4,800psi gasket stress with the same bolting on API manways
- ▶ Engineered to fit and seal existing flange arrangements
- ▶ Available in all conventional sheet gasket materials



20" Shell Manway  
Conventional  
Full-Face

Gasket Contact  
Area  
282in<sup>2</sup>

API 650 OPRA™ provides 57% less area/57% lower torque required



20" Shell Manway  
VSP OPRA™

Gasket Contact  
Area  
120in<sup>2</sup>

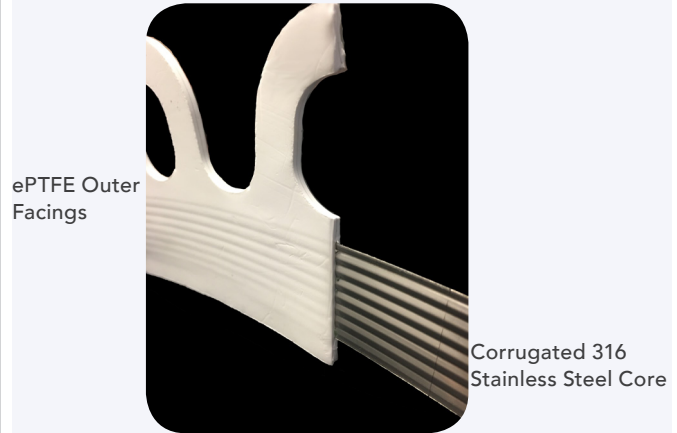
VSP Technologies deploys a team of Engineers and Fluid Sealing Specialists who provide engineered solutions for your unique sealing requirements.

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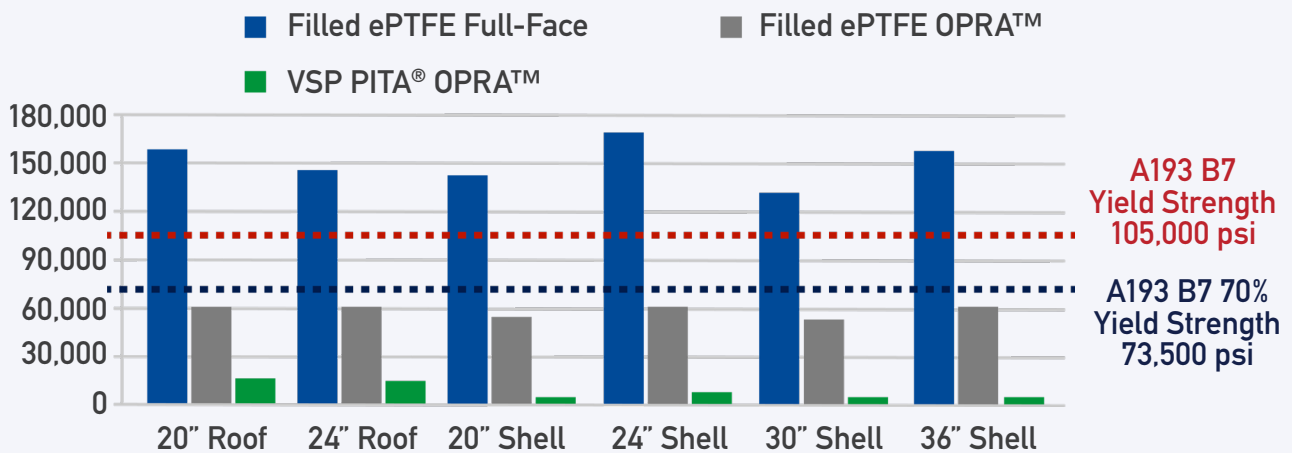
VSP PITA™ API 650 OPRA™

VSP PITA® OPRA™

- ▶ Most reliable gasket design and material for API 650 manways
- ▶ Corrugated stainless steel core fully encapsulated in ePTFE produces lowest minimum torque, high chemical inertness, and lower torque loss



Min Assembly Bolt Stress (psi)



Sealability

- ▶ Most sheet gasket materials require between 3,000-4,800 psi gasket stress to seal
- ▶ At max bolt load, API 650 manways can generate less than 2,000 psi gasket stress on conventional full-face gaskets
- ▶ VSP's OPRA™ technology reduces minimum assembly torque and bolt stress by an average 57%
- ▶ VSP's patented PITA® technology can be utilized in API 650 OPRA™ design to further lower minimum bolt stress



Ensure complete mechanical and specification compliance with VSP's API 650 OPRA™ Torq-Kit™

All Flange rework components in one box with assembly instructions to ensure reliable performance

Contact VSP for ordering information