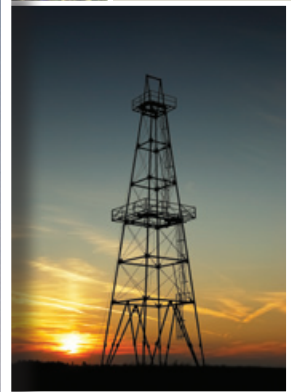
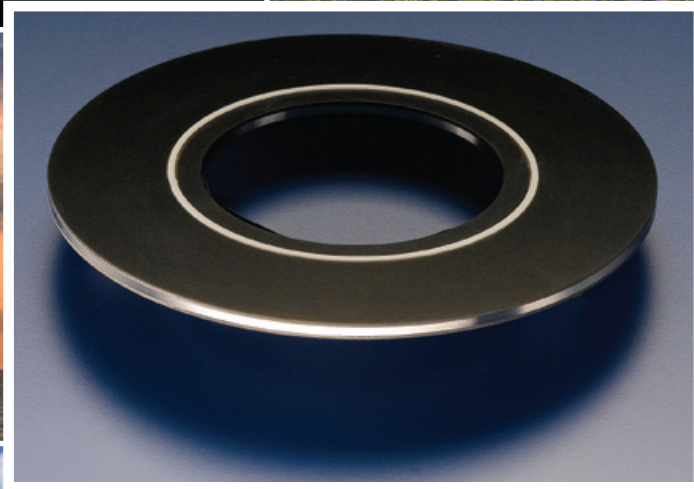




**High-Reliability Flange Seal for Electrical
Isolation and Sealing in Very Critical Service**



ENGINEERED SOLUTIONS

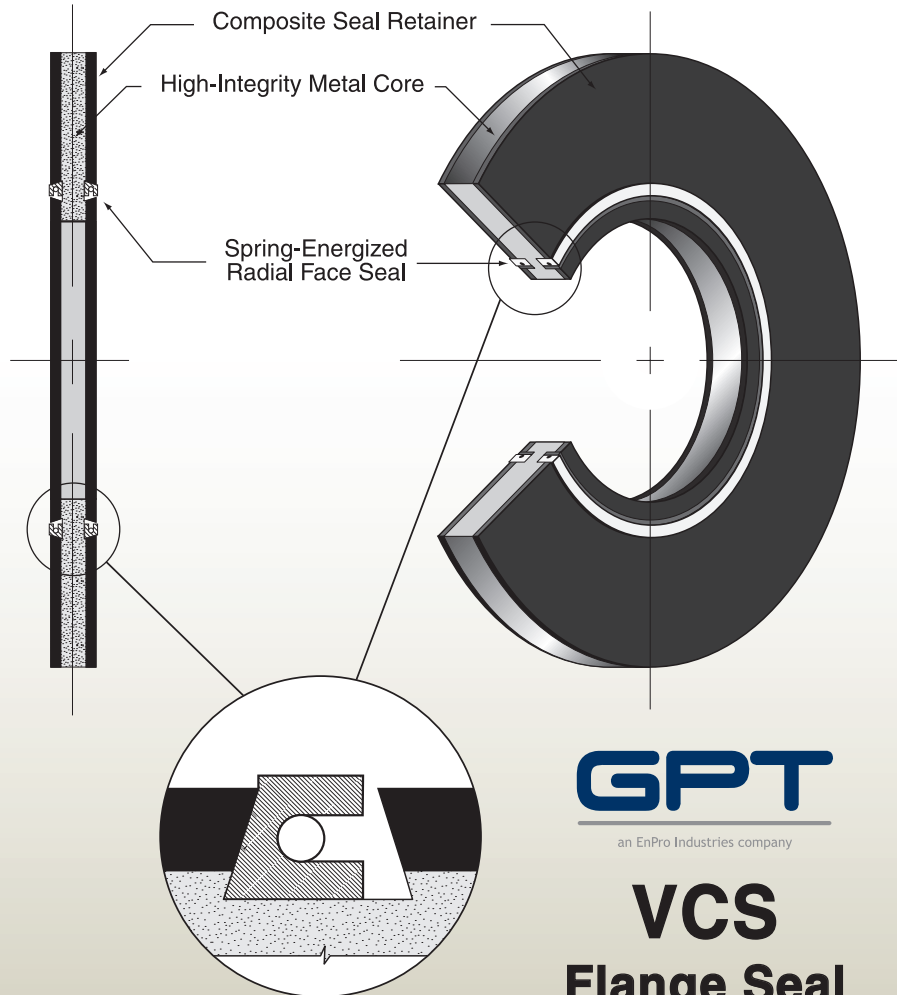
INTRODUCTION

The GPT VCS is a "Very Critical Service" system designed for electrical flange isolation and general sealing applications. This seal is suitable for use in raised-face, flat-face and RTJ flanges in all pressure classes including API 10,000 psi service. In addition to its superior sealing characteristics and excellent dielectric properties, the VCS is ideal for isolating flanges made from dissimilar metals thus mitigating galvanic corrosion and for mitigating localized flange face corrosion.

The VCS was originally designed to provide a reliable sealing solution for electrical isolation of critical flanges, particularly where phenolic ring gaskets had been failing in RTJ flanges. The system was successfully developed and tested by a major oil and gas company prior to initial service approval. After demonstrating the VCS to be superior to all competing products for sealing and isolating, the VCS was placed in operational service in 1981. Since then, hundreds of thousands of VCS kits have been placed into service throughout the world. Current users include virtually every international oil and gas company operating in every major worldwide market.

VCS Primary Features and Benefits Include:

- High-Reliability sealing and isolating system for critical service
- Withstands corrosive environments including high CO₂, H₂S and produced water
- Outstanding electrical isolation properties for cathodic protection
- Protects flange faces from media-induced corrosion and flow-induced erosion
- Mitigates galvanic corrosion in dissimilar metal flange joints
- Decreases flange/bolt makeup stresses
- Easy installation and removal
- Reusable seal retainer and seals
- No phenolic or polypropylene materials used



GPT
an EnPro Industries company

VCS
Flange Seal





VCS DESIGN

The unique design of the VCS system incorporates high-strength, glass-reinforced epoxy laminate bonded to a stainless steel core. This provides the strength of a traditional metallic seal while maintaining complete electrical isolation between the flange faces. Seal grooves are machined through the laminate isolating material and into the stainless steel core. This provides a strong base for the seal to seat into and breaks the potential leak/weep path that is inherent in glass laminate materials. Spring-energized Teflon internal face seals are installed in the dovetail-shaped seal grooves provide pressure-activated sealing that sets the VCS apart from other less reliable sealing solutions. Other seal configurations are also available such as Viton, Nitrile or Silicon.



ELECTRICAL ISOLATION

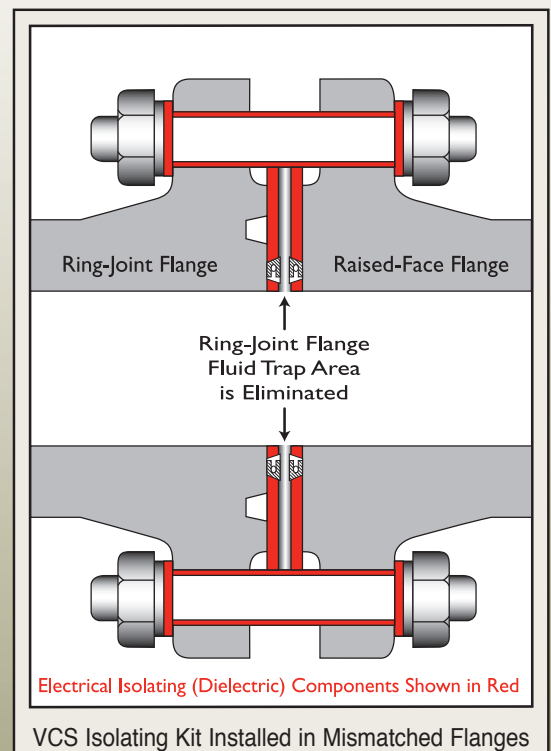
In addition to its superior sealing characteristics, the GPT VCS distinguishes itself by providing electrical flange isolation in a high-strength sealing mechanism. The VCS significantly decreases electrical potential between two flange faces by providing a non-conducting, non-metallic interface. This effectively eliminates corrosion resulting from dissimilar metals contact or ground current induced corrosion of metal piping components. When used with isolating sleeves and washers, the VCS is particularly effective in breaking electrical conductivity in piping systems with cathodic protection systems.

What makes the VCS unique among isolating gaskets is its strength and durability. Traditional isolating gaskets have been fragile and prone to failure because they are often made from brittle, non-metallic materials (e.g. phenolic resin) and are not capable of withstanding imperfect installation practices. The VCS's steel core and patented construction enables the seal to withstand far more system pressure, pressure cycling, bending moments, over-torquing and overall abuse than conventional isolating gaskets with zero risk of product failure.

SEALING CHARACTERISTICS

The primary job that any gasket must perform is to seal the pressure differential between the internal and external environment. The VCS performs this task through the use of its spring-energized, pressure-activated sealing elements. At low system pressure, the spring acts to deflect the lips of the seal, thus enabling low pressure sealing. As the pressure increases and comes in direct contact with the sealing element, the system pressure deflects the seal lips and more sealing force is applied against the flanges. This high pressure sealing is accomplished while maintaining complete electrical flange isolation. This high-reliability sealing system makes the GPT VCS the seal to use when failure cannot be tolerated.

The fact that the VCS uses pressure-activated sealing elements which are located inboard of the ring groove on RTJ flanges has the additional benefit of allowing the VCS to seal mismatched RTJ to raised-face or flat-face flanges. This feature is very useful when replacing valves using stock inventory that may have a different flange face than the mating flanges.



VCS Isolation System Advantages and Benefits

- Extreme high-reliability sealing and isolating solution for all critical services
- Seals and insulates at all pressures up through ANSI 2500 class and API 15000 psi service
- Withstands severe service conditions including large bending moments, vibration, temperature and pressure cycling
- Designed to withstand corrosive environments, including high concentrations of CO₂, H₂S, produced water, etc.
- Outstanding isolation properties for cathodic protection
- Pressure-activated seals provide high confidence sealing and eliminate costly leaks
- Seal is sized to the bore to protect flange faces from media-induced corrosion and flow-induced erosion
- Prevents turbulent flow at flanged connections
- Mitigates galvanic corrosion in dissimilar metal flanges
- High-strength laminate material resists failure due to excess compression (e.g. over tightening bolts)
- Available to match any flange specification (ANSI, API, MSSP, BS, DIN, AS, others)
- Can mate mismatched RTJ with raised-face flanges
- Easy installation, make up and removal:
 - Flanges do not have to be spread as with ring gaskets
The VCS easily slips into place
 - Sealing system results in low required bolt loads
Less make up force is required resulting in less flange and bolt stress
 - VCS is self-aligning and centering, quick to install; no special tools are required
- Maintenance-free, corrosion-resistant design is resistant to deforming under load, which makes the gasket reusable

Represented by:



GPT World Headquarters