

Smaller, more reliable alternative to conventional flanges

A bolted flange with a Vector Techlok® sealring

Vector Flangelok® has been developed to offer a smaller, more reliable and higher integrity alternative to conventional flanges.

Developed as a derivative of the well established Vector Techlok® product range, Flangelok® employs the same proven, pressure energized Vector Techlok® sealring. When sized to match the pipe bore, Flangelok® allows for a much more compact and/or high performance flange to be engineered. This concept has now been realized as a defined product range for existing ASME pressure classes which provides for significant weight and space reduction without sacrificing external load capacity or code compliance.

Vector Flangelok® is a versatile product with several flange configurations to suit application needs, together with a host of variants of the Techlok® sealring to fulfill all aspects of oilfield and petrochemical operations.

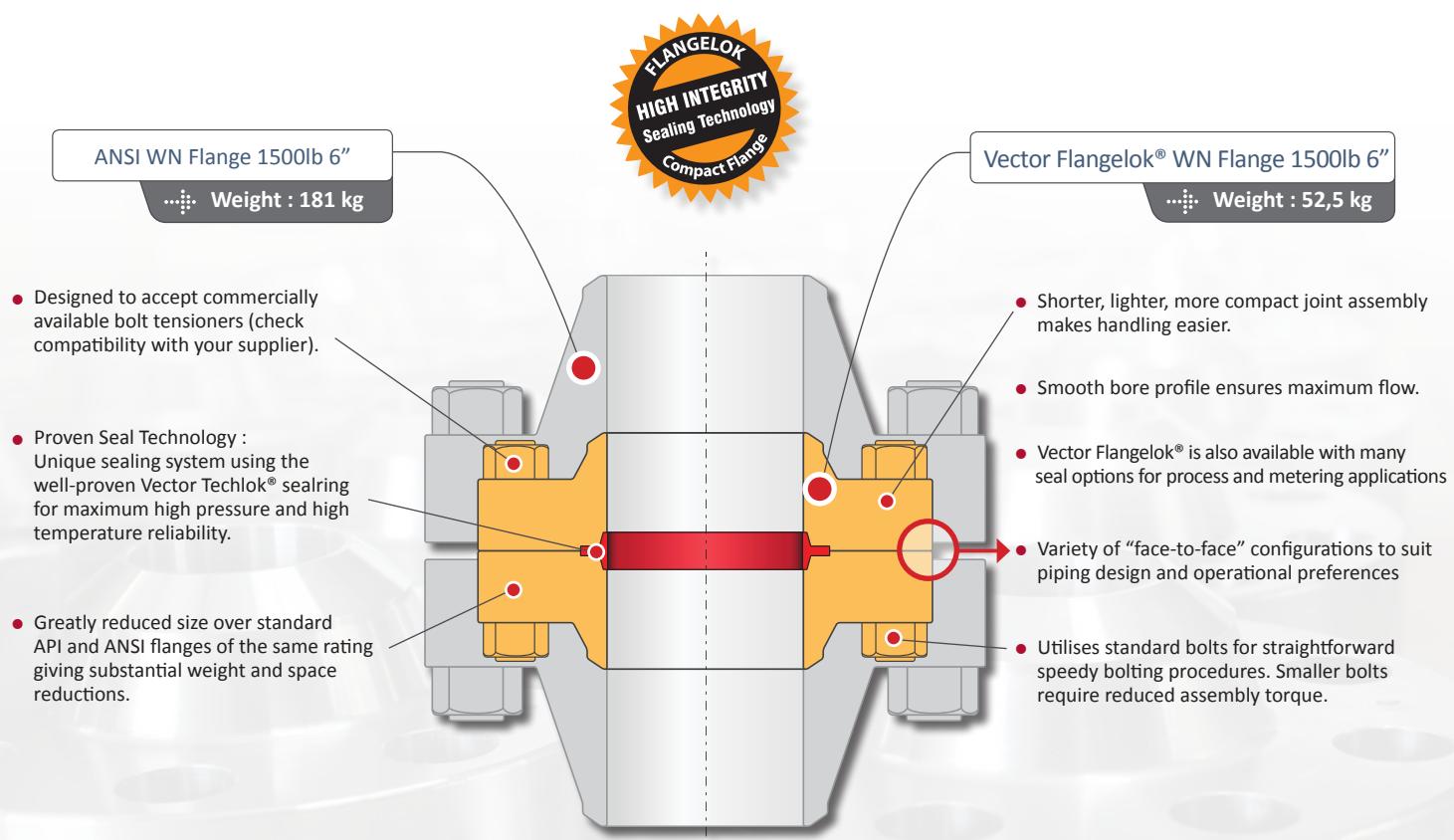
Vector Flangelok® is smaller and easier to handle in confined spaces, utilizing smaller bolting and tightened with standard tooling. This will contribute to significant savings, particularly where exotic materials are specified. Flangelok® is available in sizes 1" to 24" and ASME pressure classes 600lb to 2500lb (larger or bespoke sizes available on request) ; API 5K and 10K equivalent rated Flangeloks are derived from the 1500lb and 2500lb dimensions respectively.



VECTOR
Flangelok® connector



NASA gas storage facility - Vector Flangelok® manways

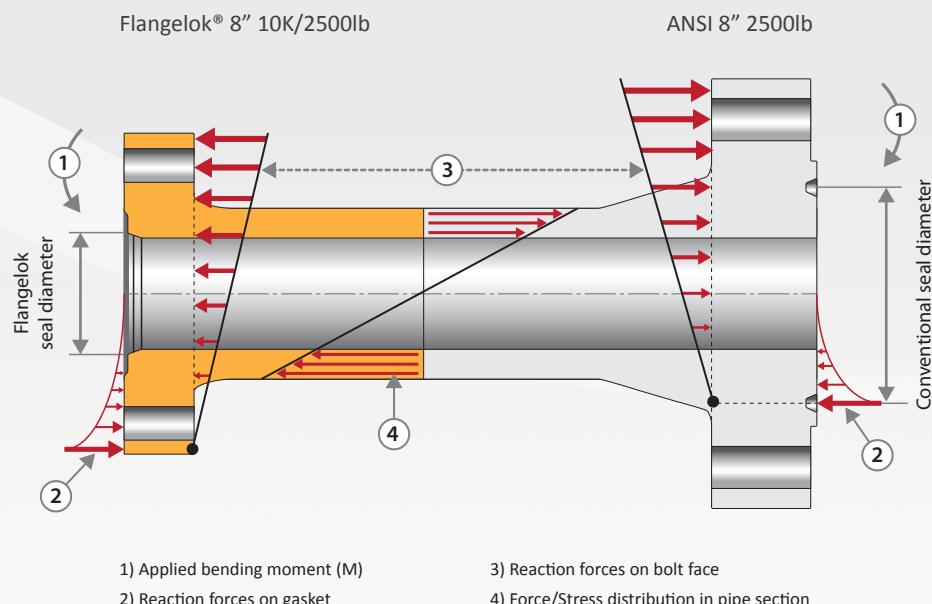


Vector Flangelok® connector

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“Every Action has an equal and opposite reaction” - Newton’s third law

The diagram (right) shows the forces reacting at the bolt and flange faces under applied bending moment. The reaction force at the flange face must equal the total reaction force at the bolt face, resulting in very high localized contact forces between the flanges. For Vector Flangelok®, this reaction at the flange face is harmless metal-to-metal contact between flanges (or the Vector Techlok® sealring rib), whereas with conventional flanges the reaction serves to locally crush the gasket on the compression side of the joint and cyclic bending will ultimately deteriorate the gasket seal.



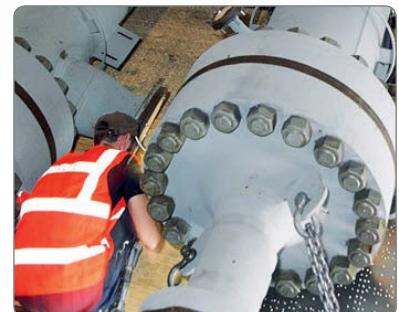
Design codes

- ASME III, VIII
- ANSI
- API
- BS 5500
- UK Offshore regulations
- Country codes

Products can also be supplied to meet client's specific requirements.



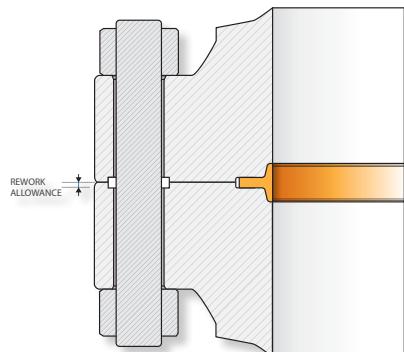
2 metre vessel Flangelok®



Vector Flangelok® vessel conversion
High pressure heat exchangers, China

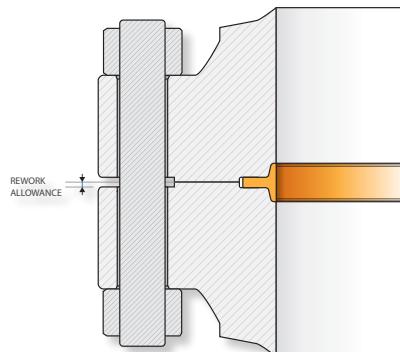
Vector Flangelok® facing options

TYPE 1 : Fully Recessed seat (standard)



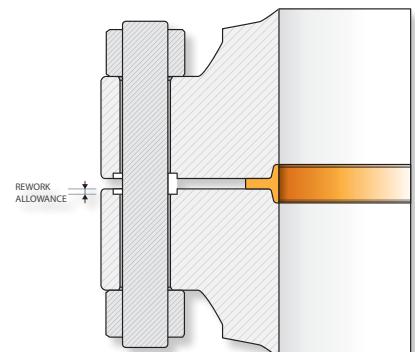
- Features :
- Full face-to-face contact
 - External contact reduces water ingress
 - High bending capacity
 - Most rigid option
 - Over torque on bolts will not distort flange

TYPE 2 : Semi Recessed seat



- Features :
- Gap available for flange spreading
 - Part face-to-face contact

TYPE 2 : Non Recessed seat



- Features :
- Gap available for flange spreading
 - Sealing visibility
 - Flange separation reduced for disassembly
 - Can fit sealring identification flags if necessary

Benefits

- **Superior Sealing Technology**

Vector Techlok® sealings are completely confined between the flange sections, and each seal pocket has protective shoulders eliminating fluid impingement. The sealing cannot be damaged by over-tightening bolts; excessive bolt force is reacted at the sealing rib, or flange faces.

- **High integrity**

Conventional flanges to BS, DIN, ANSI and API standards have low leakage reliability when compared to girth welded pipes. Vector Flangelok® proven high leak integrity means that they not only reduce direct costs caused by leakage, but also reduce environmental impact. Flangelok® flanges are also specified and in use in piping and risers where girth welded pipes would otherwise be the preferred solution.

- **Streamline Bore**

A streamline bore seat which facilitates a smooth flow throughout the joint. This arrangement makes the flange correspondingly resistant to erosion damage.

- **Reusable sealings**

Unlike spiral wound gaskets, reusable sealings give greater flexibility for hydro-testing and commissioning prior to service.

- **API compliance**

The Vector Flangelok® design principles will allow for API design criteria to be satisfied for flanges manufactured from material conforming to API (i.e. 60k materials such as AISI 4130, Duplex and Superduplex grades). Flangelok® flanges will not allow for dimensional inter-changeability with API Flanges, but will provide reduced weight and size for the equivalent pressure ratings.

- **Reduced weight and size**

Vector Flangelok® flanges are smaller in diameter than conventional flanges, making it possible to construct even closer pipe runs with smaller openings for pipe access, and easier reeling, trenching or burial. They also offer significant weight reductions over conventional flanges, with typical savings in the order of 65-70%.

- **Third party interfacing equipment**

Readily available machining details and support for interface with associated equipment such as valves, pumps and metering equipment.

- **Solid models can be provided for CAD layouts**

- **Standard bolt grades :**

B7, B16, L7, L7M, B7M and B8.

Bolts can be tightened using conventional torque or tension tools. A minimum bolt stress of 37500psi (259MPa) is recommended, enabling clients to simplify their bolting procedures by establishing standard methods for each size of bolt.

- **Weld Overlay**

Vector Flangelok® can be provided with weld overlay in the seat pocket or full weld cladding on all wetted surfaces. Normally weld overlay is provided in Alloy 625; however, other weld materials are also available. Weld overlay Flangelok® provide an excellent means of utilizing carbon steel flanges in potentially corrosive applications.

- **Facing options (see figures opposite page)**

Vector Flangelok® is available with three facing options :

- Type 1 : Fully-recessed
- Type 2 : Semi-recessed
- Type 3 : Non-recessed



VECTOR
Flangelok® connector

Exploded view
Vector Flangelok® 14" 2500lb

Sealring types

Vector Techlok® Sealring



The standard Vector Techlok® sealring offers assured joint integrity first time, every time. Reduced gasket forces and seal diameter maximize the load capacity of the components

and the time-proven pressure energized bore seal gives a high integrity gas-tight metal-to-metal seal. All Techlok® sealings meet NACE hardness requirements.

Transition sealring



Transition sealings are available to seal two different seat sizes. Normally this may accommodate pipe specification breaks of the same nominal size, i.e. 6in46 hub

matching a 6in52 hub would require a 46/52 transition ring. Only certain sizes are stocked.

D-Seal compatibility



All Vector Techlok® clamps are compatible with D-seal hub connectors. D-seals are available in all sizes and are incorporated into Vector Analysis software for full load

evaluation. D-seals provide an optional low profile sealing system within the standard Techlok® hub geometry providing full face to face contact between hubs. D-seal connectors provide slightly higher load capacities and are compatible with other existing designs. Full Pressure-Temperature tables are available for the Vector Techlok® D-seal connector range.

Blind sealings



Blind sealings are an effective means of blocking off pipe runs and can normally take full line pressure.

Vector Techlok® blind sealings are typically used as an auxiliary pressure isolation device, rather than a permanent installation. Blind sealings are not suitable for cyclic pressure.

Strainer/Acoustic Sealring



Strainer and acoustic sealings are custom Vector Techlok® sealings, designed and manufactured to the client's specifications. During start up phases these can be used to protect

high value equipment such as valves, pumps and compressors. Strainer and Acoustic sealring can be manufactured from any traditional material associated with the Vector Techlok® sealring.

Reverse Integrity Testing (RIT) Rings



Freudenberg Oil & Gas Technologies has developed a means of testing any connector using a Vector Techlok® metal sealring in-situ, either prior to, or in place of, a line leak test which

saves time and ensures seal integrity. There are two variations of this product, firstly a modified standard Techlok® ring and secondly, an alternative design for those sealring sizes that cannot be modified. Both designs are available with or without an integral test pipe. The Vector Techlok® RIT-ring with integral test pipe can be "retro-fitted" to existing equipment, whilst RIT-rings without a test pipe are used in hubs/flanges with pre-drilled test ports and joints using recessed seat pockets.