



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

**CERTIFICATE NO. P-12918**  
This Certificate consists of 3 pages

*This is to certify that the*  
**Pipe Couplings**  
*with type designation(s)*  
**SPO COMPACT FLANGES**

*Manufactured by*  
**Vector International AS**  
DRAMMEN, Norway

*is found to comply with*  
DNV Offshore Standard DNV-OS-E201  
based on  
ASME VIII Div.2, Part 5

*Application*

The above mentioned piping elements have, with reference to section 300(c)(4) and section 304(7)(2) of ASME B31.3, been found qualified for use in piping systems required to be designed and built in accordance with ASME B31.3 (which refer to ASME VIII).

*Place and date*  
Høvik, 2008-09-18  
for DET NORSKE VERITAS AS

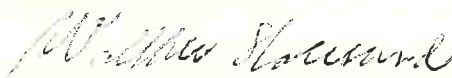


Astri Haukerud Gaarde  
*Head of Section*



*Local Office*

*This Certificate is valid until*  
2012-09-30



Walther Storesund  
*Surveyor*

**Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

Type of flanges as given in Vector International Doc. No. A-10601, Rev. 3 Designer's MANUAL with IX Ring.

## Application/Limitation

### Limitation

Temperature range: -200 to + 250 deg C (material dependant)  
Max. working press.: CL 150 - CL4500i (20 barg – 520 barg)  
Sizes: 1/2" - 48"

Size of Class 2500 and 4500i flanges is limited to 24".

Materials:

<u>Flange (typical)</u>	<u>IX Ring</u>	<u>Bolts</u>
A 350 LF2	CS 360 (F52)	A 193 B7
A 105	A 182 F51	A 193 B16
A 182 F316	A 564 630 (17-4 PH)	A 320 L7
A 694 F60*		A 320 L43
A 694 F65		
A 182 F51		
A 182 F53		

\*This material is not a pressure vessel material listed as approved by the applied pressure vessel code ASME VIII div 2. However, the material has been evaluated by DNV and found equivalent to materials listed by ASME for this application.

- Materials are to be according to ASME VIII div 2 or documented to be equivalent.
- Minimum design temperature according to ASME, maximum design temperature 250°C.
- It is assumed that the flanges are correctly corrosion protected, and if sour service then NACE requirements need to be documented.
- To comply with DNV OS-F101, Submarine Pipeline Systems, the bolting should comply with section 7 paragraph B 400.

It should be noted that there is limited experience, testing and calculations of CL4500i flanges with nominal size above NPS 12 or DN 300. The behaviour of these flanges should be verified by FEM analyses to assess the capacity for external loads when the external loads are significant.

### **Type Approval documentation**

Vector International Doc. No. A-10601, Rev. 3 Designer's MANUAL.  
DNV Type Approval Certificate no.: 98-OSL-ST-0223 rev. 1 valid until July 2002.  
DNV Statement of Conformity dated 1998-07-22, Strength Calculation Method

### **Tests carried out**

Combined Pressure and Axial load Test, 6" class 1500 SPO Compact Flange. Verification of FEA results for Type Approval according to ASME VIII division 2.

### **Marking of product**

For traceability to this Type Approval the final product are to be marked with:

- Manufacturers name
- Type Designation

### **Product certificate**

If a product certificate is required, a survey by the local DNV representative is required to qualify that the actual production complies with the specifications from this Type Approval certificate.

### **Certificate retention survey**

For retention of the certificate DNV shall perform a survey before expiry date of this certificate. Any changes to the type approved products shall be informed DNV in writing.

END OF CERTIFICATE