



**TRANSNET**  
*pipelines*

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**THIS SPECIFICATION COVERS THE REQUIREMENTS FOR  
STEEL FLANGE INSULATING GASKET KITS.**

**PL 415 G**

REV. 001

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1. SCOPE

- 1.1. This specification covers Transnet Pipelines requirements for a steel flange insulating gasket kit comprising of applicable gasket material, insulating sleeves, insulating washers, machine faced steel washers, and, where applicable, stud bolts and nuts.
- 1.2. Operating temperature will not exceed 45°C.
- 1.3. **Low Pressure** insulating gasket sets must be suitable for use with class 150 and 300 rated ASME B16.5 latest standard raised face weld neck flanges.
- 1.4. **High Pressure** insulating gasket sets must be suitable for use with class 600 and 900 rated ASME B16.5 latest standard raised face weld neck flanges.

2. PRODUCT SPECIFICATIONS

- 2.1. All the material must be compatible with the following products as listed below:
  - 2.1.1. Regular and Premium Petrol's
  - 2.1.2. Diesel
  - 2.1.3. Fuel Alcohol
  - 2.1.4. Crude Oil
  - 2.1.5. Jet Fuel
  - 2.1.6. Synthetic Olefinic Petrol
  - 2.1.7. Unleaded Petrol
- 2.2. In addition, the characteristics of the following products are approximately as follows:

2.2.1. **Fuel Alcohol**

C <sub>2</sub> Alcohol content	:	70 mass % minimum
C <sub>3</sub> and C <sub>4</sub> Alcohol content	:	28 mass % maximum
C <sub>5</sub> and heavier Alcohol content	:	2 mass % maximum
Acidity	:	0,09 mg/KOH/g maximum
Water content	:	0,9 mass % maximum
Denatured alcohol	:	Gasoline content of 5 mass %
Chemical formula	:	C <sub>2</sub> H <sub>5</sub> OH to C <sub>6</sub> H <sub>13</sub> OH
PH	:	6 - 8

2.2.2. **Synthetic Olefinic Petrol**

C<sub>5</sub> H<sub>10</sub>  
C<sub>6</sub> H<sub>12</sub>

2.2.3. **Unleaded Petrol**

Will contain - Benzine  
Toluene  
Xylene  
Ketones (known in USA as "Oxygenated Gasoline")

3. REFERENCES

- 3.1. ASME Standard B16.5 / latest: Pipe Flanges and Flanged Fittings.

- 3.2. ASME B31.4 - 1992: Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols.

4. **INSULATING GASKET REQUIRMENTS**

The flange insulating kit shall conform to the following minimum requirements: -

- See attached drawings No: PL 121376 for Low Pressure Insulating gasket sets and drawings No: PL 115670 for High Pressure Insulating gasket sets.

**4.1. Low Pressure Insulating gasket sets**

- 4.1.1. Transnet Pipelines has standardized on the following insulating gasket set for low pressure applications: Novus HDS-1 Dielectric Gasket Material for Flange Insulating Kits.
- 4.1.2. To be compatible with complete product range as prescribed in Clause 2 of this specification.
- 4.1.3. Insulating gasket sets must be suitable for use with class 150 and 300 rated ASME B16.5 latest standard raised face weld neck flanges.
- 4.1.4. The gasket set shall be suitable for pressures up to 5000 kPa.
- 4.1.5. The gasket material shall have a minimum thickness of 3mm.
- 4.1.6. The gasket material Dielectric Strength shall be  $\geq 20\text{kV/mm}$ .
- 4.1.7. The gasket material inside diameter shall be 4mm smaller than the inside diameter size specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges. The 4mm allowance is to ensure a gasket material recess of 2mm into the flange assembly.
- 4.1.8. The gasket material outside diameter shall be similar than the outside diameter size specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges.

**4.2. High Pressure Insulating gasket sets**

- 4.2.1. Transnet Pipelines has standardized on the following insulating gasket set for high pressure applications:
- Pikotec VCS.
  - Nema grade G10 insulating material.
  - Spring Energized Teflon face seals.
- 4.2.2. To be compatible with complete product range as prescribed in Clause 2 of this specification.
- 4.2.3. Insulating gasket sets must be suitable for use with class 600 and 900 rated ASME B16.5 latest standard raised face weld neck flanges.
- 4.2.4. The gasket set shall be suitable for pressures up to 15000 kPa.
- 4.2.5. The gasket material inside diameter shall be 4mm smaller than the inside diameter size specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges. The 4mm allowance is to ensure a gasket material recess of 2mm into the flange assembly.

- 4.3. Insulating Sleeves applicable to Low and High pressure Insulating Gasket sets.

- 4.3.1. Insulating Sleeve Material = G10 GRE Standard.

## STEEL FLANGE INSULATING KITS

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- 4.3.2. Inside diameter of the sleeve to suit the outside diameter of bolt specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges.
  - 4.3.3. Outside diameter of the sleeve shall not be less than 1mm smaller than the flange hole diameter for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges.
  - 4.3.4. The sleeve shall be of a length to ensure a longitudinal gap of 1mm on each end when the flange bolts are fully tightened - i.e. the sleeve must therefore be 2mm shorter than the final distance between the nuts.
- 4.4. Insulating Washers applicable to Low and High pressure Insulating Gasket sets.
- 4.4.1. Insulating Washer = 1/8" HCS X37-SA (Standard)
  - 4.4.2. Low pressure Insulating Gasket Insulating washer thickness:
    - 4.4.2..1.  $\leq 6''$  pipe = 4mm
    - 4.4.2..2.  $\leq 10''$  pipe = 5mm
    - 4.4.2..3.  $\geq 12''$  pipe = 6mm
  - 4.4.3. High pressure Insulating Gasket Insulating washer thickness to suit the Torque value specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges.
- The inside diameter of the washer shall have a neat fit on the insulating sleeve for each class and rating size.
- 4.5. Machined Steel washers applicable to Low and High pressure Insulating Gasket sets.
- 4.5.1. Machined Steel washer material = Stainless Steel.
  - 4.5.2. The inside diameter of the washer shall have a neat fit onto the insulating sleeve. No rattling or force fit.
  - 4.5.3. S/Steel washer shall have truly parallel machined faces.
  - 4.5.4. Low pressure Insulating Gasket Machined Steel washer thickness:
    - 4.5.4..1.  $\leq 6''$  pipe = 4mm
    - 4.5.4..2.  $\leq 10''$  pipe = 5mm
    - 4.5.4..3.  $\geq 12''$  pipe = 6mm
  - 4.5.5. High pressure Insulating Gasket Machined S/Steel washer thickness to suit the Torque value specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges.
  - 4.5.6. The outside diameter of the S/Steel washer shall be 2mm smaller than that of the Insulating washer.
- 4.6. Bolting – Stud or Machined
- In cases where bolts are required as part of the Insulating Gasket set, stud or machined bolts shall meet the following specification:
- 4.6.1. The supplier shall calculate the length of the bolts per applicable flange size and class rating, per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges and addition taking into account the dimensions of the insulating and S/Steel washers. Bolts shall extend a min of 3 treads completely through the nuts on both sides.
  - 4.6.2. Bolts and nuts shall conform to ASTM A193 grade B7 and ASTM A194 Grade 2H respectively.

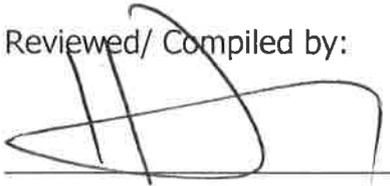
**5. INSTALLATION REQUIREMENTS**

- 5.1. The flange insulating kit shall be properly marked for easy identification and adequately packed to prevent damage.
- 5.2. The flange bore must be determined as to ensure final insulating gasket ordering data. The flange bore dimension to be stamped or marked on the applicable flange for the purpose of future replacement works.
- 5.3. The flange faces surface area needs to be clean, free of any defects and parallel.
- 5.4. Flange bolts to be fastened as per Torque values specified for the applicable flange size and class rating as per the relevant table in ASME B16.5 latest standard for raised face weld neck flanges. This practice is of utmost importance for the installation of the Pikotec VCS high pressure insulating gasket kits.

**6. DRAWINGS**

- 6.1 Low Pressure Insulating Gasket Drawing No: PL 121376
- 6.2 High Pressure Insulating Gasket Drawing No: PL 115670

Reviewed/ Compiled by:



19/06/2019.

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**Date**

Approved by:



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19-6-2019

**Date**

G10 GRE STANDARD INSULATING SLEEVE

HCS X37-SA (STANDARD) INSULATING WASHER

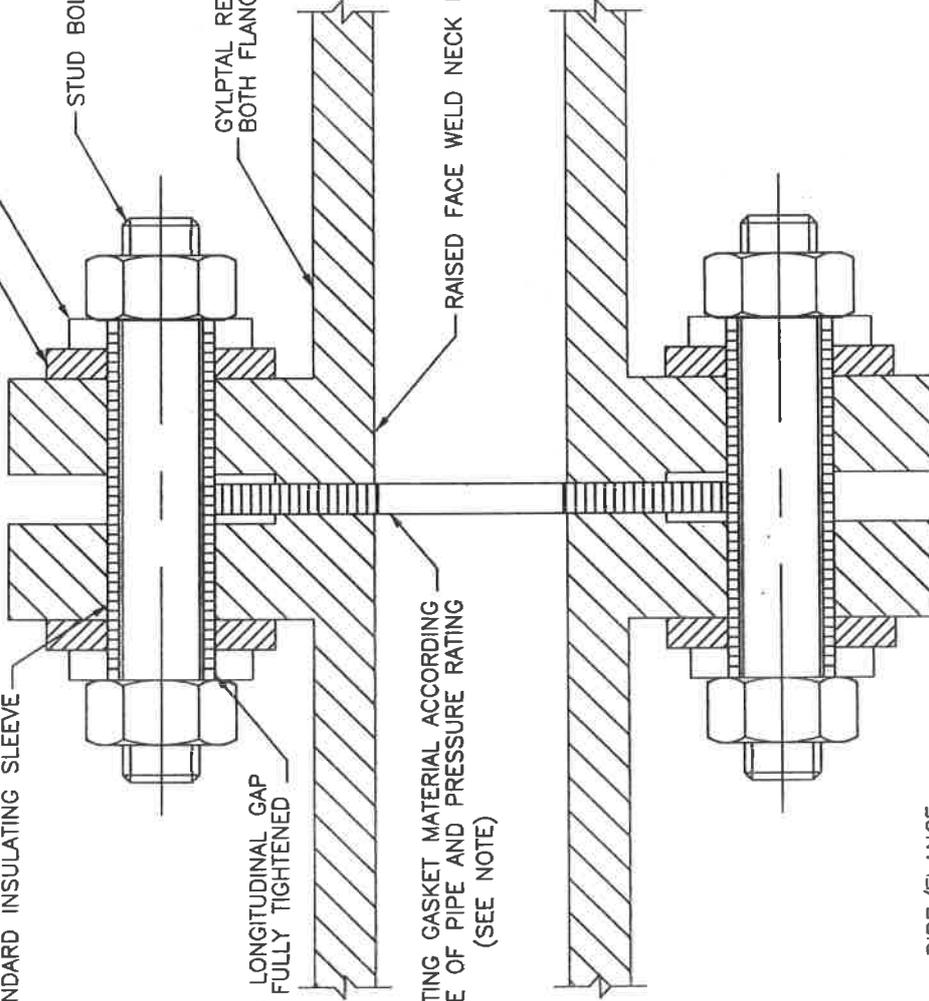
MACHINED STEEL WASHERS

STUD BOLT TO ASME B16.5

GYLPTAL RED INSULATING PAINT  
BOTH FLANGES

RAISED FACE WELD NECK FLANGE

1 mm LONGITUDINAL GAP  
WHEN FULLY TIGHTENED



NOTE: 1. INSIDE DIAMETER OF GASKET = PIPE/FLANGE  
INSIDE DIAMETER MINUS 4mm  
2. FOR GASKET DETAILS SEE TRANSNET  
PIPELINES SPECIFICATION PL415(LATEST)

REVISIONS

PROJECT NAME

RE-DRAWN FROM PLSK-2131

DRAWN	K.N.	REF.	
TRACED	CAD	DATE	10-03-2011
CHECKED		APPROVED	
SCALE	N.T.S.		
DRAWING No.	PL 115670		
REV			



TYPICAL INSULATION JOINT: 600# TO 900#  
HIGH PRESSURE INSULATING GASKET -- PIKOTEK VCS

HCS X37-SA (STANDARD) INSULATING WASHER

MACHINED STEEL WASHERS

STUD BOLT TO ASME B16.5

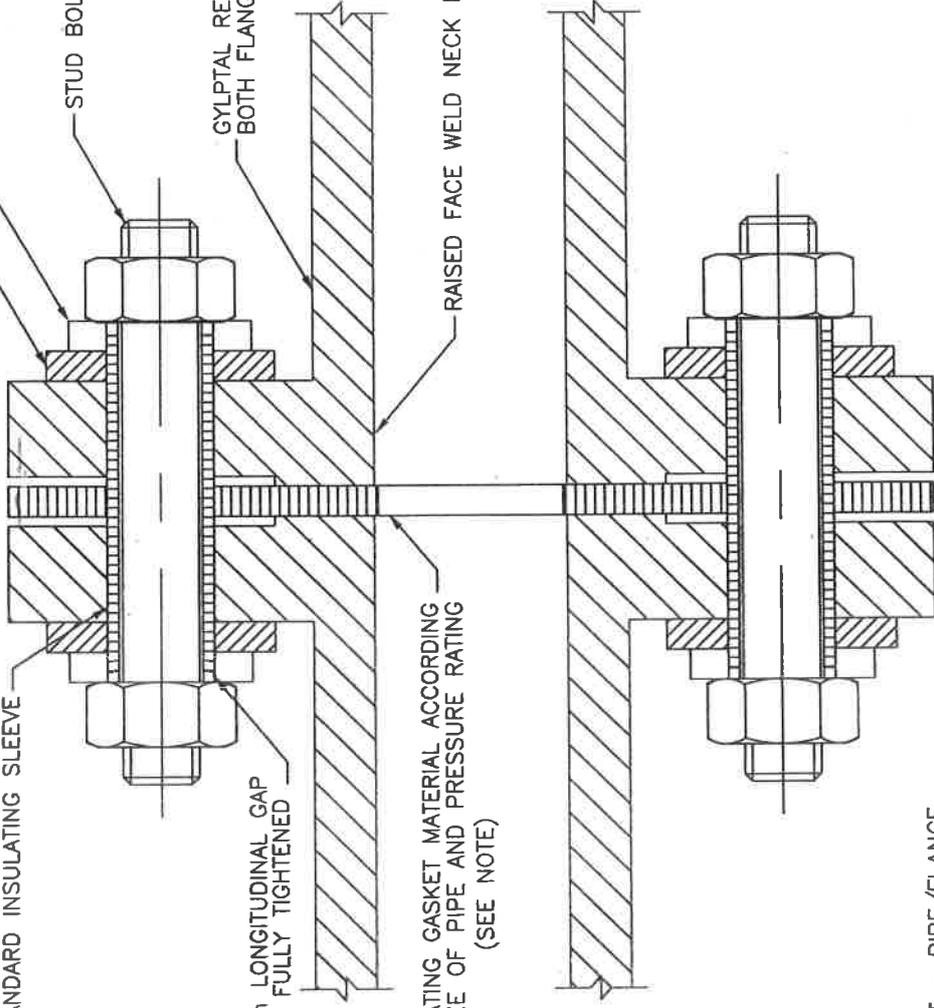
GYLPTAL RED INSULATING PAINT  
BOTH FLANGES

RAISED FACE WELD NECK FLANGE

G10 GRE STANDARD INSULATING SLEEVE

1 mm LONGITUDINAL GAP  
WHEN FULLY TIGHTENED

INSULATING GASKET MATERIAL ACCORDING  
TO SIZE OF PIPE AND PRESSURE RATING  
(SEE NOTE)



NOTE: 1. INSIDE DIAMETER OF GASKET = PIPE/FLANGE  
INSIDE DIAMETER MINUS 4mm  
2. FOR GASKET DETAILS SEE TRANSNET  
PIPELINES SPECIFICATION PL415(LATEST)

REVISIONS  
PROJECT NAME

THIS DRAWING SUPERCEDES PLSK-2131

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TRACED	CAD	DATE	16-05-2019
CHECKED		APPROVED	
SCALE	N.T.S.		
DRAWING No.	PL 121376		
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TYPICAL INSULATION JOINT: 150# TO 300#  
LOW PRESSURE INSULATING GASKET - HDS1