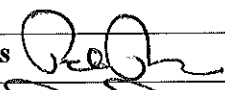
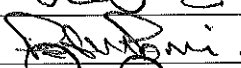
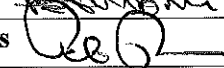


**Bayu Undan / Darwin LNG Facilities  
Technical Delivery Terms**

<b>Material Description: Gaskets</b>	
<b>Doc No:</b> TDT 01	<b>Rev:</b> 5
<b>Prepared By:</b> P. Rogers 	<b>Date:</b> 16 June 2008
<b>Checked By:</b> P. Pomi 	<b>Doc Con Ref:</b> ALL/CMP/SPE/001
<b>Approved By:</b> P. Rogers 	

**1 INTRODUCTION**

This document outlines the general technical requirements for the supply of gaskets required for the ConocoPhillips (COP) Bayu-Undan and Darwin LNG Facilities.

Specifically, the nominated codes and standards shall apply to all gaskets purchased for these facilities.

**2 CODES AND STANDARDS**

ASME B16.5	Pipe, Flanges and Flange Fittings.
ASME B16.20	Metallic Gaskets for Pipe Flanges – Ring Joint, Spiral Wound and Jacketed.
ASME B16.21	Non Metallic Flat Gaskets for Pipe Flanges.
ASME B16.47	Large Diameter Steel Flanges
API 6A	Specification for Wellhead and Christmas Tree Equipment
ASTM F336	Non Metallic Enveloped Gaskets for Corrosive Service.
EN 10204	Metallic Products – Types of inspection documents.

**3. FLAT RING SYNTHETIC FIBRE GASKETS**

The design and dimensions shall be in accordance with ASME B16.21.

The gasket shall consist of high quality compressed synthetic fibre jointing with glass/aramid fibres and NBR binder.

The surface shall have a roughness of 0.4Ra.

Thickness of gasket shall be 1.5 mm up to DN 600(24”) and 3 mm for DN 650 (26”) and larger.

Sizes DN 15 (½”) up to and including DN 600 (24”) to match RF according to ASME B16.5.

Sizes above DN 600 (24”) shall be in accordance with ASME B16.47 Series B.

*(The use of Asbestos is prohibited)*

#### **4 SPIRAL WOUND GASKETS**

This specification only applies to spiral wound gaskets in the range ASME Class 150-2500.

The design and dimensions of the gaskets shall be in accordance with ASME B16.20 (except as detailed below).

Austenitic Stainless Steel gaskets spiral windings shall be of a grade 316 or 316L stainless steel (SS), with chevron graphite non asbestos filler, complete with outer and inner 316 or 316L SS rings, 4.5 mm thick.

Alloy 825 gaskets spiral windings to be 4.5 mm thick complete with Alloy 825 outer and inner ring and windings to ASTM B423 UNS N09925, chevron graphite non-asbestos filler.

For Category "M" fluid service only – the specification is as above for SS and alloy 825 but inner ring to have graphite facings.

Sizes DN 15(½") up to and including DN 600(24") to match raised face (RF) flange according to ASME B16.5. Sizes above DN 60 (24") shall be in accordance with ASME B16.47 Series B.

Colour coding shall be in accordance with the requirements of ASME B16.20.

*(The use of Asbestos is prohibited)*

#### **5 RING TYPE JOINT GASKETS**

Ring Type Joint gaskets shall be manufactured to API 6A Type "R" oval in section and shall conform to ASME B16.20. Alternatively, octagonal in lieu of oval sections may be supplied, subject to COP approval.

Austenitic Stainless Steel ring joints shall have a Brinell hardness not exceeding 160 HB.

Sizes DN 15(½") up to and including DN 600(24") shall conform dimensionally to ASME B16.5.

Sizes above DN 600(24") shall be in dimensional accordance with ASME B16.47 Series "A" RTJ.

#### **6. FULL FACE NEOPRENE RUBBER GASKETS**

The design and dimension shall be in accordance with ASME B16.21.

ASTM D1330 Gr 1 or 2. Hardness shall be between 60-65 Shore A.

Sizes DN 15(½") up to and including DN 600(24") to match Full Face (FF) flange according to ASME B16.5.

Sizes above DN 600(24") shall be in accordance with ASME B16.47 Series B.

Total thickness of gasket shall be 3.0 mm.

#### **7. PTFE ENVELOPE GASKETS (AT1)**

Dimensions shall be in accordance with ASME B16.21. Gasket construction shall be in accordance with ASTM F336, compressed fibre gasket, PTFE, reinforced together with PTFE, envelope.

Total thickness of gasket shall be 1.5mm.

*(The use of Asbestos is prohibited)*

## 8 GASKETS FOR GRE SYSTEMS (KROLL & ZILLER TYPE)

The dimensions shall be in accordance with ASME B16.21.

Sizes DN 80(3") up to and including DN 600 (24") shall be type G-ST-P/S NBR outer with steel core to suit ASME B16.5 Class 150 or Class 300 Flanges as applicable.

Sizes DN 650(26") up to and including DN 1000(40") shall be type G-ST-P/S NBR outer with steel core to suit ASME B16.47 Series B, Class 150 Flanges.

Kroll and Ziller gasket types specified above are "qualified" for use with Glass Reinforced Epoxy Piping systems. No alternatives are permitted.

## 9 TRACEABILITY AND CERTIFICATION REQUIREMENTS

All certificates shall be originals or certified copies in conformance with EN 10204 as follows:

- Ring type gaskets shall be certified to 3.1 requirements and traceable to product grade.
- Spiral wound gaskets shall be certified to 2.1 requirements and traceable to product grade.
- All other gaskets shall be certified to 2.1 and traceable to product type.

The certificates shall be in the English language or in other languages if they are accompanied by an endorsed and dated English translation of the contents.

## 10 MARKING REQUIREMENTS

As a minimum each gasket shall show size rating and material(s). The following additional markings shall apply:

ITEM TYPE	MARKING LOCATION	MARKING TYPE
Spiral Wound	Round nose low stress stamp	On the outer centering ring
RTJ Gaskets	Vibro-etching	RTJ Gaskets: On the outer rim
Fibre gasket	Waterproof paint or ink stencil	On the label attached to gasket

## 11 PRESERVATION AND SHIPPING REQUIREMENTS

Gaskets up to and including DN 400(16") shall be packed in waterproof paper and separated with plastic spacers.

Spiral wound DN 450(18") and larger shall be mounted on reinforced backing boards using high strength strapping.

Ring type joints of larger sizes shall be individually wrapped in waterproof paper.

Crating and packages shall be suitable for opening and resealing without difficulty or damage.

Preservation shall be such that if the packaging is disturbed, then negligible degradation is permitted for a minimum period of 12 months from dispatch from the vendor's works. Crating and packages shall be marked with clear handling, storage and warning instructions to protect against damage to the preservation applied.