

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Miscellaneous

with type designation(s)

Plugs, Unions & Union Adapters, Part Numbers: See Page 2

Issued to

**FMC Technologies Inc. - Fluid Control
Stephenville TX, United States**

is found to comply with

DNVGL-OS-E101 – Drilling plant, Edition July 2015

DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2015

Application :

See Page 2

Issued at **Houston** on **2017-06-13**

This Certificate is valid until **2022-05-11**.

DNV GL local station: **Houston Containers**

for **DNV GL**

Approval Engineer: **Kairy Otero**

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**Nick Prokopuk
Team Lead**

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.



Job Id: **262.1-005941-11**
 Certificate No: **TAD00000R7**

Product descriptions

The following unions have been Type Approved:
 (A: Approved)

Standard Service

Size	Fig. Standard			Fig. Detach.			
	602	1002	1502	602	1002	1502	2002
LPT:							
1"	A	A	A	-	-	-	-
1.25"	A	A	-	-	-	-	-
1.5"	A	A	A	-	-	-	-
2"	A	A	A	-	-	-	-
2.5"	A	A	-	-	-	-	-
3"	A	A	A	-	-	-	-
4"	A	A	A	-	-	-	-
5"	-	A	-	-	-	-	-
Butt Weld:							
1"	A	A	A	-	-	A	-
1.25"	A	A	-	-	-	-	-
1.5"	A	A	A	-	-	A	-
2"	A	A	A	A	A	A	A
2.5"	A	A	A	-	-	-	-
3"	A	A	A	A	A	A	A
4"	A	A	A	A	A	A	-
5"	-	A	-	-	-	-	-
5.5"	-	A	-	-	A	-	-
6"	-	A	-	-	-	-	-

Standard Service

Size	Fig. Standard:			Fig. Detach:			
	602	1002	1502	602	1002	1502	2002
NPST:							
1	-	-	A	-	-	-	-
1.5	-	-	A	-	-	-	-
2	A	A	A	A	-	A	-
3	A	A	A	A	A	A	-
4	A	A	A	A	A	-	-
INTEGRAL:							

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1	-	-	-	-	-	A	-
1.5	-	-	-	-	-	A	-
2	-	-	-	-	-	A	A
2.5	-	-	-	-	A	-	-
3	-	-	-	A	A	A	A
4	-	-	-	A	A	A	A
5.5	-	-	-	-	A	-	-
6.63	-	-	-	-	A	-	-

Sour Gas Service

Size	Fig. Standard			Fig. Detach:			
	602	1002	1502	602	1002	1502	2002
LPT							
1	A	-	A	-	-	-	-
1.25	A	-	-	-	-	-	-
1.5	A	-	-	-	-	-	-
2	A	A	A	-	-	-	-
2.5	-	A	A	-	-	-	-
3	A	A	A				
4	A	A	A				

Sour Gas Service

Size	Fig. Standard			Fig. Detach:			
	602	1002	1502	602	1002	1502	2202
Butt Weld							
1"	A	A	A	-	-	A	-
1.5"	A	A	-	-	-	-	-
2"	A	A	A	A	-	A	A
2.5"	A	-	-	-	-	-	A
3"	A	A	A	A	-	A	A
4"	A	A	-	A	-	A	-
5"	-	A	-	-	-	-	-
6"	-	A	-	-	-	-	-
NPST:							
2	A	A	A	-	-	-	-
3	A	A	A	-	-	-	-
4	A	A	-	-	-	-	-

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INTEGRAL							
1	-	-	-	-		A	-
1.5	-	-	-	-		-	-
2	-	-	-	A	A	A	A
2.5	-	-	-	-		-	A
3	-	-	-	A		A	A
4	-	-	-	A	A	A	-
5.5	-	-	-	-		-	-
6.63	-	-	-	-		-	-

Application/Limitation

The Approval is valid only for the fields of application and operational limitations as follows:

1. Fresh and sea water lines
2. Mud systems, choke and kill system, and cement system
3. Well service lines for cementing, fracturing, acidizing and flow testing.
4. Hydraulic lines, including BOP control lines.
5. Utility lines.

Note: For piping systems rated 3000 psi or above, threaded connections shall not be used for mud system, choke and kill system, cement system or well test system, or joints in other piping systems subject to bending or vibrational loads.

Operating Temperature Range: -20°F to 225°F*

*Note: The Weco Fig 1502 Union Adapters are acceptable for use at 10,000 psi for Standard Service at +20°F to 350°F

Maximum Working Pressure:

<u>Fig. No</u>	<u>Std Service</u>	<u>Sour Service</u>
602	6,000 psi	6,000 psi
1002 (1"-4")	10,000 psi	7,500 psi
1002 (over 4")	7,500 psi	5,000 psi
1502	15,000 psi	10,000 psi
2002	20,000 psi	-
2202	-	15,000 psi

Type Approval Documentation

Fabrication Procedures

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- Procedures related to testing, NDE, welding, marking, etc. shall be reviewed by DNVGL Surveyor.

Marking of Products

- Products shall be marked at least with part and serial numbers for traceability.

Periodical Assessments

- Periodical assessments shall be carried out bi-yearly for retention of TAC.

Comments

- Project No. PP184379-1, Attn. Andrew Huf.