

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve**

with type designation(s)
2" 10k Sour Service Choke,
3" 10k Sour Service Choke

Issued to

Red Deer Ironworks Inc.
Red Deer, AB, Canada

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Houston** on **2019-03-28**

for **DNV GL**

This Certificate is valid until **2024-03-27**.

DNV GL local station: **Vancouver**

Approval Engineer: **Srujanbabu Sridharala**

Meindert van Mierlo
Head of Section

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.



Product description

- 2" & 3" Choke Integral, Fig 1502 10,000 psi Sour Services

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition
- NACE MR0175/ISO 15156, 'Petroleum and Natural Gas Industries – Materials for Use in H₂S – Containing Environments in Oil and Gas Production', 3rd Edition

Application/Limitation

- Max. Working Pressure: 10,000 psi
- Test Pressure: 15,000 psi
- Design Temperature: -50 °F to 250 °F
- Service: Sour (H₂S)
- Material Class: DD
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

Drawing no	Revision	Description
AC21502-A001	4	ADJUSTABLE CHOKE 2in FIG 1502 SOUR SERVICE
AC215025X7-A001	3	ADJUSTABLE CHOKE 2in FIG 1502 (5 X 7 SERIES) SOUR SERVICE
AC31502-A001	4	ADJUSTABLE CHOKE 3in FIG 1502 SOUR SERVICE
AC31502-3X1-A001	3	ADJUSTABLE CHOKE 3in FIG 1502 X 1in STEM SOUR SERVICE
AC215TOPWORKS-A001	6	ADJUSTABLE CHOKE TOPWORKS 2in FIG 1502 SOUR SERVICE
AC315TOPWORKS-A001	7	ADJUSTABLE CHOKE TOPWORKS 3in FIG 1502 SOUR SERVICE
AC315TOPWORKS-3X1-A001	1	ADJUSTABLE CHOKE TOPWORKS 3in FIG 1502 X 1in STEM SOUR SERVICE
PC21502COMPLETE-A001	4	POSITIVE CHOKE COMPLETE 2in FIG 1502 SOUR SERVICE
PC215025X7COMPLETE-A001	1	POSITIVE CHOKE COMPLETE 2in FIG 1502 (5 X 7 SERIES) SOUR SERVICE
PC31502COMPLETE-A001	4	POSITIVE CHOKE COMPLETE 3in FIG 1502 SOUR SERVICE
PC21502-A001	3	POSITIVE CHOKE 2in FIG 1502 SOUR SERVICE
PC215025X7-A001	2	POSITIVE CHOKE 2in FIG 1502 (5 X 7 SERIES) SOUR SERVICE
PC31502-A001	4	POSITIVE CHOKE 3in FIG 1502 SOUR SERVICE
CHKCN21502CS-A001	2	CAGE NIPPLE - CHOKE SAVER - 2in FIG 1502 SOUR SERVICE
BC215MT-A001	4	BLANKING CAP - 2in FIG 1502 MALE SOUR SERVICE
CH3CAPASSY-A001	4	CHOKE CAP - 3in POSITIVE CHOKE SOUR

Drawing no	Revision	Description
		SERVICE
WNKIT21502-A001	3	WINGNUT KIT - 2in FIG 1502 SOUR SERVICE
WNKIT31502-A001	3	WINGNUT KIT - 3in FIG 1502 SOUR SERVICE
ACST34TCT-A001	5	CHOKE STEM 3/4in
ACSE34ASFL-A001	3	CHOKE SEAT FULLY LINED 3/4"
BEANFTXX-64-A001	2	POSITIVE CHOKE BEAN
ACST3X1TC-A001	1	CHOKE STEM 3X1in
ACSE3X1ASFL-A001	1	CHOKE SEAT FULLY LINED 3X1
ACST2TC-A001	2	CHOKE STEM 2in
ACSE2ASFL-A001	5	CHOKE SEAT FULLY LINED 2"
BEANFTXXX-64-A001	2	POSITIVE CHOKE BEAN
PC21502-P001	7	POSITIVE CHOKE 2in FIG 1502 SOUR SERVICE
		POSITIVE CHOKE 2in FIG 1502 (5 X 7 SERIES)
PC215025X7-P001	3	SOUR SERVICE
TH-2in-1502-F	8	THREAD - 2in 1502 FEMALE
TH-2in-1502-M	7	THREAD - 2in 1502 MALE
PC31502-P001	7	POSITIVE CHOKE 3in FIG 1502 SOUR SERVICE
TH-3in-1502-F	9	THREAD - 3in 1502 FEMALE
TH-3in-1502-M	11	THREAD - 3in 1502 MALE
		ADJUSTABLE CHOKE TOPWORKS BONNET 2in FIG
AC215FINBON-P001	6	1502 SOUR SERVICE
TH-2in-1502-M-NS	7	THREAD - 2in 1502 MALE NON SEGMENTED
		ADJUSTABLE CHOKE TOPWORKS 3in FIG 1502
AC315TOPWORKS-P001	6	SOUR SERVICE
		HAND WHEEL - 12in O.D. FOR 2in 1502
AC215HANDLE-P001	2	TOPWORKS
AC215JUNKRING-P001	5	JUNK RING - 2in 1502 ADJUSTABLE CHOKE
AC215STEMGUIDE-P001	3	STEM GUIDE - 2in 1502 ADJUSTABLE CHOKE
		BLANKING CAP - 2in FIG 1502 MALE SOUR
BC215MT-P001	9	SERVICE
		THREAD - 2in 1502 MALE NON SEGMENTED
TH-2in-1502-M-NS-BC	5	BLANKING CAP
		CAGE NIPPLE - CHOKE SAVER - 2in FIG 1502
CHKCN21502CS-P001	5	SOUR SERVICE
SEG21502-P001	7	SEGMENT SET - 2in 1502
WN21502-P001	7	WINGNUT - 2in FIG 1502 SOUR SERVICE
AC3HANDLE-P001	3	HAND WHEEL - 14in O.D. FOR 3" TOPWORKS
AC3JUNKRING-P001	5	JUNK RING BODY
SEG31502-P001	8	SEGMENT SET - 3in 1502
WN31502-P001	7	WINGNUT - 3in FIG 1502 SOUR SERVICE
CH3NUT-P001	7	WINGNUT - 3in CHOKE SOUR SERVICE
PC3BLANK-P001	3	CHOKE BLANK - 3in SOUR SERVICE
PC3WASHERSS-P001	2	WASHER - 2in MAX SEAT/BEAN/ADAPTOR
ACST34TCT-P001	4	CHOKE STEM 3/4in

Job Id: **262.1-030396-1**
 Certificate No: **TAD000013F**

Drawing no	Revision	Description
ACSE34ASFL-P001	4	CHOKE SEAT FULLY LINED 3/4"
ACST3X1TC-P001	3	CHOKE STEM 3X1in
BEANFTXX-64-P001	5	POSITIVE CHOKE BEAN
ACSE3X1ASFL-P001	2	CHOKE SEAT FULLY LINED 3X1
ACH3N60ADAPT-P001	4	CHOKE SEAT ADAPTER
ACST2TC-P001	4	CHOKE STEM 2in
ACSE2ASFL-P001	6	SEAT FULLY LINED 2"
BEANFTXXX-64-P001	4	POSITIVE CHOKE BEAN

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

Document No.	Revision	Description
-	10/11/2013	API-PC21502-P001 - ChokeValveBodyCalc
-	10/11/2013	API-PC215025X7-P001 - ChokeValveBodyCalc
-	3/11/2013	API-AC215FINBON-P001 - TopWorksCalcs
-	9/19/2012	API-CHKCN21502CS-P001 - CageNippleCalc
-	10/23/2012	API-BC215MT-P001 - MaleBlankingCapCalcs
-	10/23/2012	API-TH-NPT-0.5in-ThdMastercalc
-	2/11/2013	API-PC31502-P001 - ChokeValveBodyCalc
-	3/11/2013	API-AC315TOPWORKS-P001 - TopWorksCalcs
-	2/19/2013	API-CH3CAP-P001 - WingNutCalcs
-	10/23/2012	API-PC3BLANK-P001 - ChokeBlankCapCalcs
-	10/03/2012	TH-2in-FIG-1502-ThdFemaleMastercalc
-	1/21/2013	API-TH-2in-1502-M ThdMaleMastercalc
-	1/21/2013	API-TH-2in-1502-NS-BC-M ThdMaleMastercalc
-	1/21/2013	API-TH-2in-1502-NS-M ThdMaleMastercalc
-	4/12/2013	API-TH-3in-FIG-1502-F-ThdFemaleMastercalc
-	11/22/2012	TH-3in-1502-M ThdMaleMastercalc
-	8/28/2013	API-SEG21502-P001 - SegmentCalc
-	10/03/2017	API-SEG31502-P001 - SegmentCalc
-	8/28/2013	API-WN21502-P001 - WingNutCalcs
-	8/28/2013	API-WN31502-P001 - WingNutCalcs

Materials:

Part	Material Spec.	Description	Min. Yield	Req'd Charpy @ -50 oF
Body, Wing nut, positive choke, Tee	MS-101 Rev.8	4130	75 ksi	20 ft-lbf
Seat adapter body	MS-101 Rev.8 MS-102 Rev.5	4130/4140	75 ksi/80 ksi	20 ft-lbf
Bean body	MS-114 Rev.0	4140	36 ksi	20 ft-lbf
Stem/Seat body	MS-101 Rev.8	4130/4140/	75 ksi/80 ksi/	20 ft-lbf

Job Id: **262.1-030396-1**
Certificate No: **TAD000013F**

Part	Material Spec.	Description	Min. Yield	Req'd Charpy @ -50 oF
	MS-102 Rev.5 MS-114 Rev.0	4140	36ksi	
Bonnet, Blank cap, case nipple	MS-101Rev.8/MS-102Rev.5	4130/4140	75 ksi/80 ksi	20 ft-lbf
Non metallic seals	MS-107 Rev.3	-	-	-
Wing nut segment	MS-102 Rev.5	4140	80 ksi	20 ft-lbf

Note: (1) See material specifications for additional material requirements.

Tests carried out

1. Test report dated 2019-03-19 performed on valve with serial number 41405-17, 40956-13 and 39985-16.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Fitting**

with type designation(s)
**2" 10K sour service fitting,
3" 10K sour service fitting, &
4" 10K sour service fitting**

Issued to

**Red Deer Ironworks Inc.
Red Deer, AB, Canada**

is found to comply with

**DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018**

Application :

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for **DNV GL**

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DNV GL local station: **Vancouver**

Approval Engineer: **Srujanbabu Sridharala**

**Meindert van Mierlo
Head of Section**

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.



Product description

- 2", 3", & 4" Fittings Integral, Fig 1502 10,000 psi Sour Services

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition
- NACE MR0175/ISO 15156, 'Petroleum and Natural Gas Industries – Materials for Use in H₂S – Containing Environments in Oil and Gas Production', 3rd Edition

Application/Limitation

- Max. Working Pressure: 10,000 psi
- Test Pressure: 15,000 psi
- Design Temperature: -50 °F to 250 °F
- Service: Sour (H₂S)
- Material Class: DD
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

Drawing no	Revision	Description
CR215FFFM5X7-A001	2	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES SOUR SERVICE
CR215FFFM5X7-P001	2	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES SOUR SERVICE
CR215FFFM5X7T-A001	1	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
CR215FFFM5X7T-P001	1	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
CR215FFFM-A001	3	CROSS - 2in FIG 1502 FxFxFxM SOUR SERVICE
CR215FFFM-P001	4	CROSS - 2in FIG 1502 FxFxFxM SOUR SERVICE
CR215FFFM-T-A001	3	CROSS - 2in FIG 1502 FxFxFxM 0.50in NPT TAP SOUR SERVICE
CR215FFFM-T-P001	3	CROSS - 2in FIG 1502 FxFxFxM 0.50in NPT TAP SOUR SERVICE
CR215MMMF5X7-A001	2	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES SOUR SERVICE
CR215MMMF5X7-P001	2	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES SOUR SERVICE
CR215MMMF5X7T-A001	1	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
CR215MMMF5X7T-P001	1	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
CR215MMMF-A001	2	CROSS - 2in FIG 1502 MxMxMxF SOUR SERVICE
CR215MMMF-P001	4	CROSS - 2in FIG 1502 MxMxMxF SOUR SERVICE
CR215MMMF-T-A001	3	CROSS - 2in FIG 1502 MxMxMxF 0.50in NPT TAP SOUR SERVICE
CR215MMMF-T-P001	3	CROSS - 2in FIG 1502 MxMxMxF 0.50in NPT TAP SOUR SERVICE
CR315FFFM-T-A001	4	CROSS - 3in FIG 1502 FxFxFxM 0.50in NPT TAP SOUR SERVICE
CR315FFFM-T-P001	3	CROSS - 3in FIG 1502 FxFxFxM 0.50in NPT TAP SOUR SERVICE
CR315MMMF-T-A001	4	CROSS - 3in FIG 1502 MxMxMxF 0.50in NPT TAP SOUR SERVICE

Drawing no	Revision	Description
CR315MMMFT-P001	3	CROSS - 3in FIG 1502 MxMxMxF 0.50in NPT TAP SOUR SERVICE
FLX210215F-A001	2	FLANGE ADAPTOR - 2.0625in 10K (BX-152) x 2in FIG 1502 F INTEGRAL 10,000psi SOUR SERVICE
FLX210215F-P001	4	FLANGE ADAPTOR - 2.0625in 10K (BX-152) x 2in FIG 1502 F INTEGRAL 10,000psi SOUR SERVICE
FLX210215M-A001	3	FLANGE ADAPTOR - 2.0625in 10K (BX-152) x 2in FIG 1502 M INTEGRAL 10,000psi SOUR SERVICE
FLX210215M-P001	4	FLANGE ADAPTOR - 2.0625in 10K (BX-152) x 2in FIG 1502 M INTEGRAL 10,000psi SOUR SERVICE
FLX310315F-A001	2	FLANGE ADAPTOR - 3.0625in 10K x 3in FIG 1502 F SOUR SERVICE
FLX310315F-P001	5	FLANGE ADAPTOR - 3.0625in 10K x 3in FIG 1502 F SOUR SERVICE
FLX310315M-A001	4	FLANGE ADAPTOR - 3.0625in 10K x 3in FIG 1502 M SOUR SERVICE
FLX310315M-P001	5	FLANGE ADAPTOR - 3.0625in 10K x 3in FIG 1502 M SOUR SERVICE
FLX410415F-A001	3	FLANGE ADAPTOR - 4.0625in 10K (BX-155) x 4in FIG 1502 F INTEGRAL 10,000psi SOUR SERVICE
FLX410415F-P001	4	FLANGE ADAPTOR - 4.0625in 10K (BX-155) x 4in FIG 1502 F INTEGRAL 10,000psi SOUR SERVICE
FLX410415M-A001	3	FLANGE ADAPTOR - 4.0625in 10K (BX-155) x 4in FIG 1502 M INTEGRAL 10,000psi SOUR SERVICE
FLX410415M-P001	4	FLANGE ADAPTOR - 4.0625in 10K (BX-155) x 4in FIG 1502 M INTEGRAL 10,000psi SOUR SERVICE
FT215FM-A001	4	CUSHION TEE - 2in FIG 1502 MxF SOUR SERVICE
FT215FM-P001	6	CUSHION TEE - 2in FIG 1502 MxF SOUR SERVICE
FT315FM-A001	4	CUSHION TEE - 3in FIG 1502 MxF SOUR SERVICE
FT315FM-P001	5	CUSHION TEE - 3in FIG 1502 MxF SOUR SERVICE
FT415FM-A001	3	CUSHION TEE - 4in FIG 1502 MxF SOUR SERVICE
FT415FM-P001	4	CUSHION TEE - 4in FIG 1502 MxF SOUR SERVICE
IXO315F215M-A001	4	CROSSOVER - 3in FIG 1502 F x 2in FIG 1502 M SOUR SERVICE
IXO315F215M-P001	5	CROSSOVER - 3in FIG 1502 F x 2in FIG 1502 M SOUR SERVICE
IXO315M215M-A001	2	CROSSOVER - 3in FIG 1502 M x 2in FIG 1502 M SOUR SERVICE
IXO315M215M-P001	5	CROSSOVER - 3in FIG 1502 M x 2in FIG 1502 M SOUR SERVICE
IXO415F215MBD-A001	4	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 2in FIG 1502 M SOUR SERVICE
IXO415F215MBD-P001	4	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 2in FIG 1502 M SOUR SERVICE
IXO415F315MBD-A001	5	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 3in FIG 1502 M SOUR SERVICE

Drawing no	Revision	Description
IXO415F315MBD-P001	5	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 3in FIG 1502 M SOUR SERVICE
T215FFM5X7-A001	2	TEE - 2in FIG 1502 FxFxM 5X7 SERIES SOUR SERVICE
T215FFM5X7-P001	2	TEE - 2in FIG 1502 FxFxM 5X7 SERIES SOUR SERVICE
T215FFM5X7T-A001	2	TEE - 2in FIG 1502 FxFxM 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215FFM5X7T-P001	1	TEE - 2in FIG 1502 FxFxM 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215FFM-A001	2	TEE - 2in FIG 1502 FxFxM SOUR SERVICE
T215FFM-P001	4	TEE - 2in FIG 1502 FxFxM SOUR SERVICE
T215MFF5X7-A001	2	TEE - 2in FIG 1502 MxFxF 5X7 SERIES SOUR SERVICE
T215MFF5X7-P001	2	TEE - 2in FIG 1502 MxFxF 5X7 SERIES SOUR SERVICE
T215MFF5X7T-A001	2	TEE - 2in FIG 1502 MxFxF 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215MFF5X7T-P001	1	TEE - 2in FIG 1502 MxFxF 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215MFF-A001	2	TEE - 2in FIG 1502 MxFxF SOUR SERVICE
T215MFF-P001	4	TEE - 2in FIG 1502 MxFxF SOUR SERVICE
T215MFM5X7-A001	2	TEE - 2in FIG 1502 MxFxM 5X7 SERIES SOUR SERVICE
T215MFM5X7-P001	2	TEE - 2in FIG 1502 MxFxM 5X7 SERIES SOUR SERVICE
T215MFM5X7T-A001	2	TEE - 2in FIG 1502 MxFxM 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215MFM5X7T-P001	1	TEE - 2in FIG 1502 MxFxM 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215MFM-A001	2	TEE - 2in FIG 1502 MxFxM SOUR SERVICE
T215MFM-P001	4	TEE - 2in FIG 1502 MxFxM SOUR SERVICE
T215MMF5X7-A001	2	TEE - 2in FIG 1502 MxMxF 5X7 SERIES SOUR SERVICE
T215MMF5X7-P001	2	TEE - 2in FIG 1502 MxMxF 5X7 SERIES SOUR SERVICE
T215MMF5X7T-A001	2	TEE - 2in FIG 1502 MxMxF 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215MMF5X7T-P001	1	TEE - 2in FIG 1502 MxMxF 5X7 SERIES 0.50in NPT TAP SOUR SERVICE
T215MMF-A001	2	TEE - 2in FIG 1502 MxMxF SOUR SERVICE
T215MMF-P001	3	TEE - 2in FIG 1502 MxMxF SOUR SERVICE
T315FFM-A001	2	TEE - 3in FIG 1502 FxFxM SOUR SERVICE
T315FFM-P001	2	TEE - 3in FIG 1502 FxFxM SOUR SERVICE
T315FFMX17-A001	1	TEE - 3in FIG 1502 FxFxM x17 SOUR SERVICE
T315FFMX17-P001	1	TEE - 3in FIG 1502 FxFxM x17 SOUR SERVICE
T315MFF-A001	2	TEE - 3in FIG 1502 MxFxF SOUR SERVICE
T315MFF-P001	3	TEE - 3in FIG 1502 MxFxF SOUR SERVICE
T315MFFX17-A001	2	TEE - 3in FIG 1502 MxFxF x17 SOUR SERVICE
T315MFFX17-P001	2	TEE - 3in FIG 1502 MxFxF x17 SOUR SERVICE
T315MFM-A001	2	TEE - 3in FIG 1502 MxFxM SOUR SERVICE

Drawing no	Revision	Description
T315MFM-P001	3	TEE - 3in FIG 1502 MxFxM SOUR SERVICE
T315MFMX17-A001	1	TEE - 3in FIG 1502 MxFxM x17 SOUR SERVICE
T315MFMX17-P001	1	TEE - 3in FIG 1502 MxFxM x17 SOUR SERVICE
T315MMF-A001	2	TEE - 3in FIG 1502 MxMxF SOUR SERVICE
T315MMF-P001	3	TEE - 3in FIG 1502 MxMxF SOUR SERVICE
T315MMFX17-A001	1	TEE - 3in FIG 1502 MxMxF x17 SOUR SERVICE
T315MMFX17-P001	1	TEE - 3in FIG 1502 MxMxF x17 SOUR SERVICE
T415MFF-A001	2	TEE - 4in FIG 1502 MxFxF SOUR SERVICE
T415MFF-P001	3	TEE - 4in FIG 1502 MxFxF SOUR SERVICE
T415MFM-A001	2	TEE - 4in FIG 1502 MxFxM SOUR SERVICE
T415MFM-P001	3	TEE - 4in FIG 1502 MxFxM SOUR SERVICE
WKNIT21502-A001	3	WINGNUT KIT - 2in FIG 1502 SOUR SERVICE
WKNIT31502-A001	3	WINGNUT KIT - 3in FIG 1502 SOUR SERVICE
WKNIT41502-A001	4	WINGNUT KIT - 4in FIG 1502 SOUR SERVICE
TH-2in-1502-F	8	THREAD - 2in 1502 FEMALE
TH-2in-1502-M	7	THREAD - 2in 1502 MALE
TH-3in-1502-F	9	THREAD - 3in 1502 FEMALE
TH-3in-1502-M	11	THREAD - 3in 1502 MALE
TH-3in-1502-M-NS	11	THREAD - 3in 1502 MALE NON SEGMENTED
TH-4in-1502-F	6	THREAD - 4in 1502 FEMALE
TH-4in-1502-M	8	THREAD - 4in 1502 MALE
SEG21502-P001	7	SEGMENT SET - 2in 1502
SEG31502-P001	8	SEGMENT SET - 3in 1502
SEG41502-P001	7	SEGMENT SET - 4in 1502 SOUR SERVICE
WN21502-P001	7	WINGNUT - 2in FIG 1502 SOUR SERVICE
WN31502-P001	7	WINGNUT - 3in FIG 1502 SOUR SERVICE
WN415DET-P001	8	WINGNUT - 4in FIG 1502 SOUR SERVICE

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

Document no.	Revision	Description
QF0049	17	Min. Wall Thickness sour and std service products
-	1/03/2013	API-CR215XXXX.5625T-P001 - AutoclaveCalc
-	4/24/2014	API-CR215XXXX.5625T-P001 - CrossBodyCalc
-	4/25/2014	API-CR215XXXX57.5625T-P001 - CrossBodyCalc
-	1/03/2013	API-CR315XXXX.5625T-P001 - AutoclaveCalc
-	4/24/2014	API-CR315XXXX.5625T-P001 - CrossBodyCalc
-	4/16/2013	API-FLXXX215X-P001 - AdapterFlangeBodyCalc
-	4/16/2013	API-FLXXX315X-P001 - AdapterFlangeBodyCalc
-	1/07/2013	API-FLXXX415X-P001 - AdapterFlangeBodyCalc
-	11/07/2012	API-FT215FM-P001 - FracTeeBodyCalc

Document no.	Revision	Description
-	11/07/2012	API-FT315FM-P001 - FracTeeBodyCalc
-	11/07/2012	API-FT415FM-P001 - FracTeeBodyCalc
-	11/28/2012	API-IXO215F215M-P001 - MXF CrossOverBodyCalc
-	4/18/2013	API-IXO315F315M-P001 - MXF CrossOverBodyCalc
-	4/18/2013	API-IXO415F415M-P001 - MXF CrossOverBodyCalc
-	11/27/2012	API-T215XXX-P001 - TeeBodyCalc
-	11/27/2012	API-T315XXX-P001 - TeeBodyCalc
-	1/02/2013	API-T415XXX-P001 - TeeBodyCalc
-	11/14/2012	API-TH-NPT-0.5in-ThdMastercalc
-	10/03/2012	TH-2in-FIG-1502-ThdFemaleMastercalc
-	1/21/2013	API-TH-2in-1502-M ThdMaleMastercalc
-	4/12/2013	TH-3in-FIG-1502-F-ThdFemaleMastercalc
-	11/22/2012	API-TH-3in-1502-M ThdMaleMastercalc
-	1/21/2013	API-TH-3in-1502-NS-M ThdMaleMastercalc
-	8/22/2013	TH-4in-FIG-1502-ThdFemaleMastercalc
-	11/22/2012	API-TH-4in-1502-M ThdMaleMastercalc
-	8/28/2013	API-SEG21502-P001 - SegmentCalc
-	8/28/2013	API-SEG31502-P001 - SegmentCalc
-	8/28/2013	API-SEG41502-P001 - SegmentCalc
-	8/28/2013	API-WN21502-P001 - WingNutCalcs
-	8/28/2013	API-WN31502-P001 - WingNutCalcs
-	8/28/2013	API-WN415DET-P001 - WingNutCalcs

Materials:

Part	Material Spec.	Description	Min. Yield	Req'd Charpy @ -50 °F
Body, Wing nut	MS-101 Rev.8	4130	75 ksi	20 ft-lbf
Non metallic seals	MS-107 Rev.2	-	-	-
Wing nut segment	MS-102 Rev.5	4140	80 ksi	20 ft-lbf

Note: (1) See material specifications for additional material requirements.

Tests carried out

1. Test report dated 2019-03-19 performed on fitting with serial number 41679-6.

Marking of product

For traceability the following marking is to be carried out on each product:


1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.



Job Id: **262.1-030621-1**
Certificate No: **TAD0000135**

2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve**

with type designation(s)
2" 15k Standard Service Choke,
3" 15k Standard Service Choke

Issued to

Red Deer Ironworks Inc.
Red Deer, AB, Canada

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Houston** on **2019-03-28**

for **DNV GL**

This Certificate is valid until **2024-03-27**.

DNV GL local station: **Vancouver**

Approval Engineer: **Srujanbabu Sridharala**

Meindert van Mierlo
Head of Section

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.



Product description

- 2" & 3" Choke Integral, Fig 1502 15,000 psi Standard Services

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

Drawing no	Revision	Description
AC21502.5625TSTD-A001	5	ADJUSTABLE CHOKE 2in FIG 1502 STANDARD SERVICE
AC215025X7.5625TSTD-A001	5	ADJUSTABLE CHOKE 2in FIG 1502 (5 X 7 SERIES) STANDARD SERVICE
AC31502.5625TSTD-A001	4	ADJUSTABLE CHOKE 3in FIG 1502 STANDARD SERVICE
AC31502.5625T-3X1STD-A001	3	ADJUSTABLE CHOKE 3in FIG 1502 X 1in STEM STANDARD SERVICE
AC215TOPWORKSSTD-A001	7	ADJUSTABLE CHOKE TOPWORKS 2in FIG 1502 STANDARD SERVICE
AC315TOPWORKSSTD-A001	8	ADJUSTABLE CHOKE TOPWORKS 3in FIG 1502 STANDARD SERVICE
AC315TOPWORKS-3X1STD-A001	1	ADJUSTABLE CHOKE TOPWORKS 3in FIG 1502 X 1in STEM STANDARD SERVICE
PC21502.5625TSTDCOMPLETE-A001	3	POSITIVE CHOKE COMPLETE 2in FIG 1502 STANDARD SERVICE
PC215025X7.5625TSTDCOMPLETE-A001	1	POSITIVE CHOKE COMPLETE 2in FIG 1502 (5 X 7 SERIES) STANDARD SERVICE
PC31502.5625TSTDCOMPLETE-A001	3	POSITIVE CHOKE COMPLETE 3in FIG 1502 STANDARD SERVICE
PC21502.5625TSTD-A001	4	POSITIVE CHOKE 2in FIG 1502 STANDARD SERVICE
PC215025X7.5625TSTD-A001	5	POSITIVE CHOKE 2in FIG 1502 (5 X 7 SERIES) STANDARD SERVICE
PC31502.5625TSTD-A001	4	POSITIVE CHOKE 3in FIG 1502 STANDARD SERVICE
CHKCN21502CSSTD-A001	3	CAGE NIPPLE - CHOKE SAVER - 2in FIG 1502 STANDARD SERVICE

Job Id: 262.1-030624-1
Certificate No: TAD0000139

Drawing no	Revision	Description
BC215MSTD-A001	3	BLANKING CAP - 2in FIG 1502 MALE STANDARD SERVICE
CH3CAPASSY.5625TSTD-A001	3	CHOKE CAP - 3in POSITIVE CHOKE STANDARD SERVICE
WKNIT21502STD-A001	3	WINGNUT KIT - 2in FIG 1502 STANDARD SERVICE
WKNIT31502STD-A001	5	WINGNUT KIT - 3in FIG 1502 STANDARD SERVICE
ACST34TCT-A001	5	CHOKE STEM 3/4in
ACSE34ASFL-A001	3	CHOKE SEAT FULLY LINED 3/4"
BEANFTXX-64-A001	2	POSITIVE CHOKE BEAN
ACST3X1TC-A001	1	CHOKE STEM 3X1in
ACSE3X1ASFL-A001	1	CHOKE SEAT FULLY LINED 3X1
ACST2TC-A001	2	CHOKE STEM 2in
ACSE2ASFL-A001	5	CHOKE SEAT FULLY LINED 2"
BEANFTXXX-64-A001	2	POSITIVE CHOKE BEAN
PC21502.5625TSTD-P001	6	POSITIVE CHOKE 2in FIG 1502 STANDARD SERVICE
PC215025X7.5625TSTD-P001	4	POSITIVE CHOKE 2in FIG 1502 (5 X 7 SERIES) STANDARD SERVICE
TH-2in-1502-F	8	THREAD - 2in 1502 FEMALE
TH-2in-1502-M	7	THREAD - 2in 1502 MALE
TH-0.5625in-AC-HP-F562C	2	THREAD - 0.5625in AUTO-CLAVE HIGH PRESSURE (F5625C)
PC31502.5625TSTD-P001	5	POSITIVE CHOKE 3in FIG 1502 STANDARD SERVICE
TH-3in-1502-F	9	THREAD - 3in 1502 FEMALE
TH-3in-1502-M	11	THREAD - 3in 1502 MALE
AC215FINBONSTD-P001	6	ADJUSTABLE CHOKE TOPWORKS BONNET 2in FIG 1502 STANDARD SERVICE
TH-2in-1502-M-NS	7	THREAD - 2in 1502 MALE NON SEGMENTED
AC315TOPWORKSSTD-P001	3	ADJUSTABLE CHOKE TOPWORKS 3in FIG 1502 STANDARD SERVICE
AC215HANDLE-P001	2	HAND WHEEL - 12in O.D. FOR 2in 1502 TOPWORKS
AC215JUNKRING-P001	5	JUNK RING - 2in 1502 ADJUSTABLE CHOKE
AC215STEMGUIDE-P001	3	STEM GUIDE - 2in 1502 ADJUSTABLE CHOKE
BC215MSTD-P001	6	BLANKING CAP - 2in FIG 1502 MALE STANDARD SERVICE
TH-2in-1502-M-NS-BC	5	THREAD - 2in 1502 MALE NON SEGMENTED BLANKING CAP

Drawing no	Revision	Description
CHKCN21502CSSTD-P001	3	CAGE NIPPLE - CHOKE SAVER - 2in FIG 1502 STANDARD SERVICE
SEG21502-P001	7	SEGMENT SET - 2in 1502
WN215DETSTD-P001	5	WINGNUT - 2in FIG 1502 STANDARD SERVICE
AC3HANDLE-P001	3	HAND WHEEL - 14in O.D. FOR 3" TOPWORKS
AC3JUNKRING-P001	5	JUNK RING BODY
SEG31502-P001	8	SEGMENT SET - 3in 1502
WN315DETSTD-P001	8	WINGNUT - 3in FIG 1502 STANDARD SERVICE
CH3NUTSTD-P001	4	WING NUT - 3in CHOKE STANDARD SERVICE
PC3BLANK.5625TSTD-P001	3	CHOKE BLANK - 3in STANDARD SERVICE
PC3WASHERSS-P001	2	WASHER - 2in MAX SEAT/BEAN/ADAPTOR
ACST34TCT-P001	4	CHOKE STEM 3/4in
ACSE34ASFL-P001	4	CHOKE SEAT FULLY LINED 3/4"
BEANFTXX-64-P001	5	POSITIVE CHOKE BEAN
ACST3X1TC-P001	3	CHOKE STEM 3X1in
ACSE3X1ASFL-P001	2	CHOKE SEAT FULLY LINED 3X1
ACH3N60ADAPT-P001	4	CHOKE SEAT ADAPTER
ACST2TC-P001	4	CHOKE STEM 2in
ACSE2ASFL-P001	6	SEAT FULLY LINED 2"
BEANFTXXX-64-P001	4	POSITIVE CHOKE BEAN

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

Document No.	Rev.	Description
-	4/16/2013	API-PC21502.5625TSTD-P001 - ChokeValveBodyCalc
-	10/11/2013	API-PC215025X7.5625TSTD-P001 - ChokeValveBodyCalc
-	4/10/2013	API-PC21502.5625TSTD-P001 - AutoclaveCalc
-	4/16/2013	API-AC215FINBONSTD-P001 - TopWorksCalcs
-	4/10/2013	API-CHKCN21502CSSTD-P001 - CageNippleCalc
-	1/10/2013	API-BC215M.5625TSTD-P001 - MaleBlankingCapCalcs
-	4/16/2013	API-PC31502.5625TSTD-P001 - ChokeValveBodyCalc
-	4/10/2013	API-PC31502.5625TSTD-P001 - AutoclaveCalc
-	4/16/2013	API-AC315TOPWORKSSTD-P001 - TopWorksCalcs
-	4/16/2013	API-CH3NUTSTD-P001 - WingNutCalcs
-	4/16/2013	API-PC3BLANK.5625TSTD-P001 - ChokeBlankCapCalcs
-	1/03/2013	API-TH-2in-1502-F-STD-ThdFemaleMastercalc
-	1/21/2013	API-TH-2in-1502-M-STD ThdMaleMastercalc
-	1/21/2013	API-TH-2in-1502-NS-BC-M-STD ThdMaleMastercalc
-	1/21/2013	API-TH-2in-1502-NS-M-STD ThdMaleMastercalc
-	4/12/2013	API-TH-3in-1502-F-STD-ThdFemaleMastercalc

Job Id: 262.1-030624-1
Certificate No: TAD0000139

Document No.	Rev.	Description
-	12/20/2012	API-TH-3in-1502-M-STD ThdMaleMastercalc
-	8/28/2013	API-SEG215STD-P001 - SegmentCalc
-	10/03/2017	API-SEG31502STD-P001 - SegmentCalc
-	8/28/2013	API-WN215DETSTD-P001 - WingNutCalcs
-	8/28/2013	API-WN315DETSTD-P001 - WingNutCalcs

Materials:

Part	Material Spec.	Description	Min. Yield	Req'd Charpy @ -20 oF
Body, Wing nut, positive choke, Tee	MS-104 Rev.7	4130	100 ksi	20 ft-lbf
Seat adapter body	MS-101 Rev.8 MS-102 Rev.5	4130/4140	75 ksi/80 ksi	20 ft-lbf
Beam/Seat body	MS-114 Rev.0	4140	36 ksi	20 ft-lbf
Stem body	MS-101 Rev.8 MS-102 Rev.5 MS-114 Rev.0	4130/4140/ 4140	75 ksi/80 ksi/ 36ksi	20 ft-lbf
Flange	MS-105 Rev.7	4140/4145	100 ksi/110 ksi	20 ft-lbf
Bonnet	MS-104/MS-105	4130/4140/4 145	100 ksi/100 ksi/110 ksi	20 ft-lbf
Non metallic seals	MS-107 Rev.2	-	-	-
Wing nut segment	MS-102 Rev.5	4140	80 ksi	20 ft-lbf

Note: (1) See material specifications for additional material requirements.

Tests carried out

1. Test report dated 2019-03-19 performed on valve with serial number 41405-17, 40956-13 and 39985-16.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Fitting**

with type designation(s)

**1" 15K standard service fitting,
2" 15K standard service fitting,
3" 15K standard service fitting, &
4" 15K standard service fitting**

Issued to

**Red Deer Ironworks Inc.
Red Deer, AB, Canada**

is found to comply with

DNVGL-OS-E101 – Drilling facilities, Edition January 2018**DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Houston** on **2019-03-28**for **DNV GL**This Certificate is valid until **2024-03-27**.DNV GL local station: **Vancouver**Approval Engineer: **Srujanbabu Sridharala****Meindert van Mierlo
Head of Section**

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.



Product description

- 1", 2", 3", & 4" Fittings Integral, Fig 1502 15,000 psi Standard Services

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

Drawing No.	Rev.	Description
CR215FFFM.5625TSTD-A001	2	CROSS - 2in FIG 1502 FxFxFxM 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215FFFM.5625TSTD-P001	1	CROSS - 2in FIG 1502 FxFxFxM 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215FFFM5X7.5625TSTD-A001	3	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215FFFM5X7.5625TSTD-P001	2	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215FFFM5X7STD-A001	4	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES STANDARD SERVICE
CR215FFFM5X7STD-P001	3	CROSS - 2in FIG 1502 FxFxFxM 5X7 SERIES STANDARD SERVICE
CR215FFFMSTD-A001	2	CROSS - 2in FIG 1502 FxFxFxM STANDARD SERVICE
CR215FFFMSTD-P001	1	CROSS - 2in FIG 1502 FxFxFxM STANDARD SERVICE
CR215MMMF.5625TSTD-A001	4	CROSS - 2in FIG 1502 MxMxMxF 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215MMMF.5625TSTD-P001	4	CROSS - 2in FIG 1502 MxMxMxF 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215MMMF5X7.5625TSTD-A001	3	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215MMMF5X7.5625TSTD-P001	2	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR215MMMF5X7STD-A001	4	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES STANDARD SERVICE

Job Id: **262.1-030625-1**
Certificate No: **TAD0000134**

Drawing No.	Rev.	Description
CR215MMMF5X7STD-P001	3	CROSS - 2in FIG 1502 MxMxMxF 5X7 SERIES STANDARD SERVICE
CR215MMMFSTD-A001	2	CROSS - 2in FIG 1502 MxMxMxF STANDARD SERVICE
CR215MMMFSTD-P001	1	CROSS - 2in FIG 1502 MxMxMxF STANDARD SERVICE
CR315FFFM.5625TSTD-A001	3	CROSS - 3in FIG 1502 FxFxFxM 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR315FFFM.5625TSTD-P001	2	CROSS - 3in FIG 1502 FxFxFxM 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR315FFFMSTD-A001	4	CROSS - 3in FIG 1502 FxFxFxM STANDARD SERVICE
CR315FFFMSTD-P001	3	CROSS - 3in FIG 1502 FxFxFxM STANDARD SERVICE
CR315MMMF.5625TSTD-A001	3	CROSS - 3in FIG 1502 MxMxMxF 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR315MMMF.5625TSTD-P001	3	CROSS - 3in FIG 1502 MxMxMxF 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
CR315MMMFSTD-A001	4	CROSS - 3in FIG 1502 MxMxMxF STANDARD SERVICE
CR315MMMFSTD-P001	3	CROSS - 3in FIG 1502 MxMxMxF STANDARD SERVICE
FLX215215FSTD-A001	5	FLANGE ADAPTOR - 2.0625in 15K (BX-152) x 2in FIG 1502 F INTEGRAL 15,000psi STANDARD SERVICE
FLX215215FSTD-P001	5	FLANGE ADAPTOR - 2.0625in 15K (BX-152) x 2in FIG 1502 F INTEGRAL 15,000psi STANDARD SERVICE
FLX215215MSTD-A001	4	FLANGE ADAPTOR - 2.0625in 15K (BX-152) x 2in FIG 1502 M INTEGRAL 15,000psi STANDARD SERVICE
FLX215215MSTD-P001	4	FLANGE ADAPTOR - 2.0625in 15K (BX-152) x 2in FIG 1502 M INTEGRAL 15,000psi STANDARD SERVICE
FLX315315FSTD-A001	4	FLANGE ADAPTOR - 3.0625in 15K (BX-154) x 3in FIG 1502 F INTEGRAL 15,000psi STANDARD SERVICE
FLX315315FSTD-P001	3	FLANGE ADAPTOR - 3.0625in 15K (BX-154) x 3in FIG 1502 F INTEGRAL 15,000psi STANDARD SERVICE
FLX315315MSTD-A001	3	FLANGE ADAPTOR - 3.0625in 15K (BX-154) x 3in FIG 1502 M INTEGRAL 15,000psi STANDARD SERVICE
FLX315315MSTD-P001	4	FLANGE ADAPTOR - 3.0625in 15K (BX-154) x 3in FIG 1502 M INTEGRAL 15,000psi STANDARD SERVICE
FLX415415FSTD-A001	1	FLANGE ADAPTOR - 4.0625in 15K (BX-155) x 4in FIG 1502 F INTEGRAL 15,000psi STANDARD SERVICE
FLX415415FSTD-P001	1	FLANGE ADAPTOR - 4.0625in 15K (BX-155) x 4in FIG 1502 F INTEGRAL 15,000psi STANDARD SERVICE
FLX415415MSTD-A001	1	FLANGE ADAPTOR - 4.0625in 15K (BX-155) x 4in FIG 1502 M INTEGRAL 15,000psi STANDARD SERVICE
FLX415415MSTD-P001	1	FLANGE ADAPTOR - 4.0625in 15K (BX-155) x 4in FIG 1502 M INTEGRAL 15,000psi STANDARD SERVICE
FT215FMSTD-A001	5	CUSHION TEE - 2in FIG 1502 MxF STANDARD SERVICE
FT215FMSTD-P001	5	CUSHION TEE - 2in FIG 1502 MxF STANDARD SERVICE
FT315FMSTD-A001	4	CUSHION TEE - 3in FIG 1502 MxF STANDARD SERVICE

Job Id: **262.1-030625-1**
Certificate No: **TAD0000134**

Drawing No.	Rev.	Description
FT315FMSTD-P001	5	CUSHION TEE - 3in FIG 1502 MxF STANDARD SERVICE
IXO315F215FSTD-A001	2	CROSSOVER BLOWDOWN - 3in FIG 1502 F x 2in FIG 1502 F STANDARD SERVICE
IXO315F215FSTD-P001	1	CROSSOVER BLOWDOWN - 3in FIG 1502 F x 2in FIG 1502 F STANDARD SERVICE
IXO315F215MSTD-A001	4	CROSSOVER BLOWDOWN - 3in FIG 1502 F x 2in FIG 1502 M STANDARD SERVICE
IXO315F215MSTD-P001	3	CROSSOVER BLOWDOWN - 3in FIG 1502 F x 2in FIG 1502 M STANDARD SERVICE
IXO415F215MBDSTD-A001	2	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 2in FIG 1502 M STANDARD SERVICE
IXO415F215MBDSTD-P001	2	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 2in FIG 1502 M STANDARD SERVICE
IXO415F315MBDSTD-A001	3	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 3in FIG 1502 M STANDARD SERVICE
IXO415F315MBDSTD-P001	3	CROSSOVER BLOWDOWN - 4in FIG 1502 F x 3in FIG 1502 M STANDARD SERVICE
T115MFFSTD-A001	2	TEE - 1in FIG 1502 MxFxF STANDARD SERVICE
T115MFFSTD-P001	2	TEE - 1in FIG 1502 MxFxF STANDARD SERVICE
T115MFMSTD-A001	1	TEE - 1in FIG 1502 MxFxM STANDARD SERVICE
T115MFMSTD-P001	1	TEE - 1in FIG 1502 MxFxM STANDARD SERVICE
T215FFM5X7.5625TSTD-A001	3	TEE - 2in FIG 1502 FxFxM 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215FFM5X7.5625TSTD-P001	2	TEE - 2in FIG 1502 FxFxM 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215FFM5X7STD-A001	4	TEE - 2in FIG 1502 FxFxM 5X7 SERIES STANDARD SERVICE
T215FFM5X7STD-P001	3	TEE - 2in FIG 1502 FxFxM 5X7 SERIES STANDARD SERVICE
T215FFMSTD-A001	3	TEE - 2in FIG 1502 FxFxM STANDARD SERVICE
T215FFMSTD-P001	4	TEE - 2in FIG 1502 FxFxM STANDARD SERVICE
T215MFF5X7.5625TSTD-A001	4	TEE - 2in FIG 1502 MxFxF 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215MFF5X7.5625TSTD-P001	4	TEE - 2in FIG 1502 MxFxF 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215MFF5X7STD-A001	4	TEE - 2in FIG 1502 MxFxF 5X7 SERIES STANDARD SERVICE
T215MFF5X7STD-P001	3	TEE - 2in FIG 1502 MxFxF 5X7 SERIES STANDARD SERVICE
T215MFFSTD-A001	4	TEE - 2in FIG 1502 MxFxF STANDARD SERVICE
T215MFFSTD-P001	4	TEE - 2in FIG 1502 MxFxF STANDARD SERVICE
T215MFM5X7.5625TSTD-A001	3	TEE - 2in FIG 1502 MxFxM 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE

Job Id: 262.1-030625-1
Certificate No: TAD0000134

Drawing No.	Rev.	Description
T215MFM5X7.5625TSTD-P001	2	TEE - 2in FIG 1502 MxFxM 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215MFM5X7STD-A001	4	TEE - 2in FIG 1502 MxFxM 5X7 SERIES STANDARD SERVICE
T215MFM5X7STD-P001	3	TEE - 2in FIG 1502 MxFxM 5X7 SERIES STANDARD SERVICE
T215MFMSTD-A001	5	TEE - 2in FIG 1502 MxFxM STANDARD SERVICE
T215MFMSTD-P001	5	TEE - 2in FIG 1502 MxFxM STANDARD SERVICE
T215MMF5X7.5625TSTD-A001	2	TEE - 2in FIG 1502 MxMxF 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215MMF5X7.5625TSTD-P001	1	TEE - 2in FIG 1502 MxMxF 5X7 SERIES 0.5625in HIGH PRESSURE AUTOCLAVE TAP STANDARD SERVICE
T215MMF5X7STD-A001	4	TEE - 2in FIG 1502 MxMxF 5X7 SERIES STANDARD SERVICE
T215MMF5X7STD-P001	3	TEE - 2in FIG 1502 MxMxF 5X7 SERIES STANDARD SERVICE
T215MMFSTD-A001	3	TEE - 2in FIG 1502 MxMxF STANDARD SERVICE
T215MMFSTD-P001	4	TEE - 2in FIG 1502 MxMxF STANDARD SERVICE
T315FFMSTD-A001	3	TEE - 3in FIG 1502 FxFxM STANDARD SERVICE
T315FFMSTD-P001	3	TEE - 3in FIG 1502 FxFxM STANDARD SERVICE
T315FFMX17STD-A001	2	TEE - 3in FIG 1502 FxFxM x17 STANDARD SERVICE
T315FFMX17STD-P001	1	TEE - 3in FIG 1502 FxFxM x17 STANDARD SERVICE
T315MFFSTD-A001	7	TEE - 3in FIG 1502 MxFxF STANDARD SERVICE
T315MFFSTD-P001	7	TEE - 3in FIG 1502 MxFxF STANDARD SERVICE
T315MFFX17STD-A001	3	TEE - 3in FIG 1502 MxFxF x17 STANDARD SERVICE
T315MFFX17STD-P001	2	TEE - 3in FIG 1502 MxFxF x17 STANDARD SERVICE
T315MFMSTD-A001	3	TEE - 3in FIG 1502 MxFxM STANDARD SERVICE
T315MFMSTD-P001	3	TEE - 3in FIG 1502 MxFxM STANDARD SERVICE
T315MMFSTD-A001	5	TEE - 3in FIG 1502 MxMxF STANDARD SERVICE
T315MMFSTD-P001	6	TEE - 3in FIG 1502 MxMxF STANDARD SERVICE
T315MMFX17STD-A001	2	TEE - 3in FIG 1502 MxMxF x17 STANDARD SERVICE
T315MMFX17STD-P001	1	TEE - 3in FIG 1502 MxMxF x17 STANDARD SERVICE
T415MFFSTD-A001	3	TEE - 4in FIG 1502 MxFxF STANDARD SERVICE
T415MFFSTD-P001	2	TEE - 4in FIG 1502 MxFxF STANDARD SERVICE
T415MFMSTD-A001	3	TEE - 4in FIG 1502 MxFxM STANDARD SERVICE
T415MFMSTD-P001	2	TEE - 4in FIG 1502 MxFxM STANDARD SERVICE
WKNIT11502STD-A001	2	WINGNUT KIT - 1in FIG 1502 STANDARD SERVICE
WKNIT21502STD-A001	3	WINGNUT KIT - 2in FIG 1502 STANDARD SERVICE
WKNIT31502STD-A001	5	WINGNUT KIT - 3in FIG 1502 STANDARD SERVICE
WKNIT41502STD-A001	4	WINGNUT KIT - 4in FIG 1502 STANDARD SERVICE
TH-0.5625in-AC-HP-F562C	2	THREAD - 0.5625in AUTO-CLAVE HIGH PRESSURE (F5625C)
TH-1in-1502-F	3	THREAD - 1in 1502 FEMALE

Drawing No.	Rev.	Description
TH-1in-1502-M	3	THREAD - 1in 1502 MALE
TH-2in-1502-F	8	THREAD - 2in 1502 FEMALE
TH-2in-1502-M	7	THREAD - 2in 1502 MALE
TH-3in-1502-F	9	THREAD - 3in 1502 FEMALE
TH-3in-1502-M	11	THREAD - 3in 1502 MALE
TH-3in-1502-M-NS	11	THREAD - 3in 1502 MALE NON SEGMENTED
TH-4in-1502-F	6	THREAD - 4in 1502 FEMALE
TH-4in-1502-M	8	THREAD - 4in 1502 MALE
SEG11502-P001	1	SEGMENT SET - 1in 1502
SEG21502-P001	7	SEGMENT SET - 2in 1502
SEG31502-P001	8	SEGMENT SET - 3in 1502
SEG415STD-P001	5	SEGMENT SET - 4in 1502 STANDARD SERVICE
WN11502-P001	3	WINGNUT - 1in FIG 1502
WN215DETSTD-P001	5	WINGNUT - 2in FIG 1502 STANDARD SERVICE
WN315DETSTD-P001	8	WINGNUT - 3in FIG 1502 STANDARD SERVICE
WN415DETSTD-P001	8	WINGNUT - 4in FIG 1502 STANDARD SERVICE

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

Document No.	Rev.	Description
QF0049	17	Min. Wall Thickness- sour & std service products
-	1/14/2013	API-CR215XXXX.5625TSTD-P001 - AutoclaveCalc
-	4/24/2014	API-CR215XXXX.5625TSTD-P001 - CrossBodyCalc
-	4/24/2014	API-CR215XXXX57.5625TSTD-P001 - CrossBodyCalc
-	3/14/2013	API-CR315XXXX.5625TSTD-P001 - AutoclaveCalc
-	4/24/2014	API-CR315XXXX.5625TSTD-P001 - CrossBodyCalc
-	11/23/2012	API-Cross Autoclave Minimum Wall Thickness - AutoclaveCalc
-	4/16/2013	API-FLXXX215XSTD-P001 - AdapterFlangeBodyCalc
-	4/15/2013	API-FLXXX315XSTD-P001 - AdapterFlangeBodyCalc
-	12/20/2018	API-FLXXX415XSTD-P001 - AdapterFlangeBodyCalc
-	2/01/2013	API-FT215FMSTD-P001 - FracTeeBodyCalc
-	2/01/2013	API-FT315FMSTD-P001 - FracTeeBodyCalc
-	4/10/2013	API-IXO215F215MSTD-P001 - MXF CrossOverBodyCalc
-	4/10/2013	API-IXO315F315MSTD-P001 - MXF CrossOverBodyCalc
-	4/10/2013	API-IXO415F415MSTD-P001 - MXF CrossOverBodyCalc
-	13/06/2014	API-T115XXXSTD-P001 - TeeBodyCalc
-	3/05/2015	API-T215XXX5X7.5625TSTD-P001 - AutoclaveCalc
-	1/11/2013	API-T215XXXSTD-P001 - TeeBodyCalc
-	1/11/2013	API-T315XXXSTD-P001 - TeeBodyCalc
-	1/11/2013	API-T415XXXSTD-P001 - TeeBodyCalc

Job Id: 262.1-030625-1
Certificate No: TAD0000134

Document No.	Rev.	Description
-	06/13/2014	API-TH-1in-FIG-1502-F-STD-ThdFemaleMastercalc
-	06/13/2014	API-TH-1in-FIG-1502-M-STD-ThdMaleMastercalc
-	1/03/2013	API-TH-2in-1502-F-STD-ThdFemaleMastercalc
-	1/21/2013	TH-2in-1502-M-STD ThdMaleMastercalc
-	4/12/2013	API-TH-3in-1502-F-STD-ThdFemaleMastercalc
-	12/27/2012	TH-3in-1502-M-STD ThdMaleMastercalc
-	8/22/2013	API-TH-4in-1502-F-STD-ThdFemaleMastercalc
-	12/27/2012	TH-4in-1502-M-STD ThdMaleMastercalc
-	6/13/2014	API-SEG115STD-P001 - SegmentCalc
-	8/28/2013	API-SEG215STD-P001 - SegmentCalc
-	8/28/2013	API-SEG315STD-P001 - SegmentCalc
-	8/28/2013	API-SEG415STD-P001 - SegmentCalc
-	9/15/2014	API-WN115DETSTD-P001 - WingNutCalcs
-	8/28/2013	API-WN215DETSTD-P001 - WingNutCalcs
-	8/28/2013	API-WN315DETSTD-P001 - WingNutCalcs
-	8/28/2013	API-WN415DETSTD-P001 - WingNutCalcs

Materials:

Part	Material Spec.	Description	Min. Yield	Req'd Charpy @ -20 °F
Body, Wing nut	MS-104 Rev.7	4130	100 ksi	20 ft-lbf
Flange	MS-105 Rev.7	4140/4145	100 ksi/110 ksi	20 ft-lbf
Non metallic seals	MS-107 Rev.2	-	-	-
Wing nut segment	MS-102 Rev.5	4140	80 ksi	20 ft-lbf

Note: (1) See material specifications for additional material requirements.

Tests carried out

1. Test report dated 2019-03-19 performed on fitting with serial number 41679-6.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve**with type designation(s)
1", 2"x1", 2", 3" & 4" Fig. 1502 Plug Valves Integral 10K

Issued to

Red Deer Ironworks Inc.
Red Deer, AB, Canada

is found to comply with

DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Houston** on **2019-03-27**for **DNV GL**This Certificate is valid until **2024-03-26**.DNV GL local station: **Vancouver**Approval Engineer: **Xiangwen Maggie Wang****Meindert van Mierlo**
Head of Section

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.



Product description

- 1", 2"x1", 2", 3" & 4" Fig. 1502 Plug Valves Integral 10K Sour Service
- 1", 2"x1", 2", 3" & 4" Fig. 1502 Plug Valves Integral 10K Sour Service – actuated versions

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition
- NACE MR0175/ISO 15156, 'Petroleum and Natural Gas Industries – Materials for Use in H₂S – Containing Environments in Oil and Gas Production', 3rd Edition

Application/Limitation

- Max. Working Pressure: 10,000 psi
- Test Pressure: 15,000 psi
- Design Temperature: -50 °F to 250 °F
- Service: Sour (H₂S)
- Material Class: DD
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PV11502-A001	4	Plug Valve - 1in FIG 1502 MxF Sour Service
PV2X11502-A001	6	Plug Valve - 2in x 1in FIG 1502 Sour Service
PV2X11502ACT-A001	6	Plug Valve - 2in x 1in FIG 1502 (Actuator Prepared) Sour Service
PV21502-A001	5	Plug Valve - 2in FIG 1502 MxF Sour Service
PV21502AP-A001	6	Plug Valve - 2in FIG 1502 MxF (Actuator Prepared) Sour Service
PV21502LT-A001	6	Plug Valve - 2in FIG 1502 MxF Low Torque Sour Service
PV21502LTAP-A001	2	Plug Valve - 2in FIG 1502 MxF Low Torque (Actuator Prepared) Sour Service
PV31502-A001	6	Plug Valve - 3in FIG 1502 MxF Sour Service
PV31502AP-A001	1	Plug Valve - 3in FIG 1502 MxF (Actuator Prepared) Sour Service
PV31502GO-A001	7	Plug Valve - 3in FIG 1502 MxF Gear Operated Sour Service
PV31502DGO-A001	6	Plug Valve - 3in FIG 1502 MxF Gear Operated Sour Service
PV31502LP-A001	2	Plug Valve - 3in FIG 1502 MxF Long Pattern Sour Service
PV31502LPAP-A001	2	Plug Valve - 3in FIG 1502 MxF Long Pattern (Actuator Prepared) Sour Service
PV31502LPGO-A001	5	Plug Valve - 3in FIG 1502 MxF Long Pattern Gear Operated Sour Service
PV31502LPDGO-A001	3	Plug Valve - 3in FIG 1502 MxF Long Pattern Gear Operated Sour Service
PV31502LT-A001	2	Plug Valve - 3in FIG 1502 MxF Low Torque Sour Service
PV31502LTAP-A001	1	Plug Valve - 3in FIG 1502 MxF Low Torque (Actuator Prepared) Sour Service
PV31502LTGO-A001	5	Plug Valve - 3in FIG 1502 MxF Low Torque Gear Operated Sour Service
PV41502-A001	6	Plug Valve - 4in FIG 1502 MxF Sour Service
PV41502GO-A001	7	Plug Valve - 4in FIG 1502 MxF Gear Operated Sour Service
WNKIT11502-A001	3	Wingnut Kit - 1in FIG 1502 Sour Service
WNKIT21502-A001	3	Wingnut Kit - 2in FIG 1502 Sour Service
WNKIT31502-A001	3	Wingnut Kit - 3in FIG 1502 Sour Service
WNKIT41502-A001	4	Wingnut Kit - 4in FIG 1502 Sour Service
PV11502-P001	4	Plug Valve - 1in FIG 1502 MxF Sour Service

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
TH-1in-1502-M	3	Thread - 1in 1502 Male
TH-1in-1502-F	3	Thread - 1in 1502 Female
PV2X11502-P001	8	Plug Valve - 2in x 1in FIG 1502 Sour Service
PV2X11502ACT-P001	3	Plug Valve - 2in x 1in FIG 1502 (Actuator Prepared) Sour Service
TH-2in-1502-F	8	Thread - 2in 1502 Female
TH-2in-1502-M	7	Thread - 2in 1502 Male
PV115BODCAP-P001	4	Body Cap - 1in FIG 1502 Sour Service
PV115FINPLUG-P001	7	Plug - 1in FIG 1502 Plug Valve
PV115FINSEATCARR-P001	13	Seat Carrier - 1in FIG 1502 Plug Valve
PV115SPACER-P001	4	Seat SPACER - 1in FIG 1502 Plug Valve
PV1ORSEALV-A001	2	Plug Seal - 1in Plug
PV1ORSEALV-P001	2	Plug Seal Backup Ring - 1in Plug
PVHD1X11502-P001	4	Handle - 1in FIG 1502 Plug Valve
PV115HDLSTOP-P001	3	Stop Plate - 1in FIG 1502 Plug Valve
SEG11502-P001	1	Segment Set - 1in 1502
WN11502-P001	3	Wingnut - 1in FIG 1502
SEG21502-P001	7	Segment Set - 2in 1502
WN21502-P001	7	Wingnut - 2in FIG 1502 Sour Service
PV21502-P001	11	Plug Valve - 2in FIG 1502 MxF Sour Service
PV21502AP-P001	3	Plug Valve - 2in FIG 1502 MxF (Actuator Prepared) Sour SERVICE
PV215BODCAP-P001	5	Body Cap - 2in FIG 1502 Plug Valve Sour Service
PV215FINPLUG-P001	9	Plug - 2in Plug Valve
PV215FINSEATCARR-P001	14	Seat Carrier - 2in FIG 1502 Plug Valve
PV2X2SPACERGLASSP HEN-P001	2	Seat SPACER - 2in FIG 1502 Plug Valve
PV2602ORSEAL-A001	2	Plug Seal - 2in Plug
PV2602ORSEAL-P001	2	Plug Seal - 2in Plug
PVHDL2X2-P001	4	Handle - 2in FIG 1502 Plug Valve
PV215HDLSTOP-P001	4	Stop Plate - 2in FIG 1502 Plug Valve
PV21502LT-P001	8	Plug Valve - 2in FIG 1502 MxF Low Torque Sour Service
PV21502LTAP-P001	3	Plug Valve - 2in FIG 1502 MxF Low Torque (Actuator Prepared) Sour Service
PV215BODCAPLT-P001	3	Body Cap - 2in FIG 1502 Low Torque Plug Valve Sour Service
PV215FINPLUGLT-P001	5	Plug - 2in Low Torque Plug Valve Sour Service
PV215FINSEATCARRLT-P001	5	Seat Carrier - 2in FIG 1502 Low Torque Plug Valve Sour Service
PVRK2LTMIN-A001	2	Minor Repair Kit - 2in FIG 1502 Low Torque Plug Valve Sour Service
PVHDL2X2LT-P001	2	Handle - 2in FIG 1502 Low Torque Plug Valve
PV215HDLSTOPLT-P001	1	Stop Plate - 2in FIG 1502 Low Torque Plug Valve
PV31502-P001	8	Plug Valve - 3in FIG 1502 MxF Sour Service
PV31502AP-P001	2	Plug Valve - 3in FIG 1502 MxF (Actuator Prepared) Sour Service
TH-3in-1502-F	9	Thread - 3in 1502 Female
TH-3in-1502-M	11	Thread - 3in 1502 Male
PV31502LP-P001	5	Plug Valve - 3in FIG 1502 MxF Long Pattern Sour Service
PV31502LPAP-P001	1	Plug Valve - 3in FIG 1502 MxF Long Pattern (Actuator Prepared) Sour Service
PV36BODCap-P001	5	Cap - 3in Sour Service
PV36BODCapLP-P001	2	Cap - 3in Long Pattern Sour Service
PV3FINPlug-P001	11	Plug - 3in Plug Valve

Job Id: **262.1-030622-1**
 Certificate No: **TAD000012N**

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PV3FINSEATCARR-P001	11	Seat Carrier - 3in Plug Valve
PV3SPACERGLASSPHE NOLIC-P001	2	Seat Carrier Spacer- 3in Plug Valve
PV3PLUGSEALS-A001	3	Plug Seals - 3in Plug
PV3PLUGSEALS-P001	3	Plug Seals - 3in Plug
PV3HANDLE-P001	3	Handle - 3in AND 4in Plug Valve
PV3HDLSTOP-P001	3	Stop Plate - 3in FIG 206, 602 AND 1502 Plug Valve
SEG31502-P001	8	Segment Set - 3in 1502
WN31502-P001	7	Wingnut - 3in FIG 1502 Sour Service
PV31502LT-P001	5	Plug Valve - 3in FIG 1502 MxF Low Torque Sour Service
PV31502LTAP-P001	2	Plug Valve - 3in FIG 1502 MxF Low Torque (Actuator Prepared) Sour SERVICE
PV315BODCAPLT-P001	1	Body Cap - 3in FIG 1502 Low Torque Plug Valve Sour Service
PV315FINPLUGLT-P001	3	Plug - 3in Low Torque Plug Valve Sour Service
PV315FINSEATCARRLT -P001	4	Seat Carrier - 3in FIG 1502 Low Torque Plug Valve Sour Service
PVRK3LTMIN-A001	4	Minor Repair Kit - 3in FIG 1502 Low Torque Plug Valve Sour Service
PV41502-P001	13	Plug Valve - 4in FIG 1502 MxF Sour Service
TH-4in-1502-F	6	Thread - 4in 1502 Female
TH-4in-1502-M	8	Thread - 4in 1502 Male
PV4BODCap-P001	2	Cap - 4in Sour Service
PV4PLUG-P001	5	Plug - 4in Plug Valve
PV4SEATCARR-P001	7	Seat Carrier - 4in Plug Valve
PV4HDLSTOP	3	Stop Plate - 4in FIG 1002 AND 1502 Plug Valve
SEG41502-P001	7	Segment Set - 4in 1502 Sour Service
WN415DET-P001	8	Wingnut - 4in FIG 1502 Sour Service
PV4SPACER-P001	2	Seat Carrier Spacer- 4in Plug Valve
PV4PlugSEALS-A001	4	Plug Seals - 4in Plug
PV4PlugSEALS-P001	3	Plug Seal Backup Ring - 4in Plug
PV2X11502HA-A001	4	Plug Valve - 2in x 1in FIG 1502 Hydraulic Actuated Sour Service
PV2X1HA-BRC1K-A001	4	BRC 1000 Hydraulic Actuator for 2in x 1in Plug Valves
BRC1KDG1-P001	1	Modified OEM Drive Gear - BRC 1000 Hydraulic Actuator - 2in, 2in LT & 2in x 1in Plug Valves
BRC1KDG3-P001	2	Drive Gear Adapter - 2in x 1in Plug Valve
BRC1K2X1PVMP-P001	1	Modified OEM Mounting Plate - BRC 1000 Hydraulic Actuator - 2in x 1in Plug Valve
PV21502HA-A001	4	Plug Valve - 2in FIG 1502 MxF Hydraulic Actuated Sour Service
PV2HA-BRC1K-A001	4	BRC 1000 Hydraulic Actuator for 2in Plug Valves
BRC1KDG2-P001	2	Drive Gear Adapter - 2in Plug Valve
BRC1K2PVMP-P001	1	Modified OEM Mounting Plate - BRC 1000 Hydraulic Actuator - 2in Plug Valve
PV21502LTHA-A001	4	Plug Valve - 2in FIG 1502 MxF Low Torque Hydraulic Actuated Sour Service
PV2LTHA-BRC1K-A001	3	BRC 1000 Hydraulic Actuator for 2in Low Torque Plug Valves
BRC1K2LTPVMP-P001	1	Modified OEM Mounting Plate - BRC 1000 Hydraulic Actuator - 2in Low Torque Plug Valve
PV31502HA-A001	5	Plug Valve - 3in FIG 1502 MxF, Hydraulic Actuated, Sour Service
PV31502LPHA-A001	4	Plug Valve - 3in FIG 1502 MxF Long Pattern, Hydraulic Actuated, Sour Service
PV3HA-BRC2K-A001	4	BRC 2000 Hydraulic Actuator for 3in Plug Valves
BRC2K3PVMP-P001	1	Modified OEM Mounting Plate - BRC 2000 Hydraulic Actuator - 3in Plug Valve

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
BRC2KDG1-P001	1	Modified OEM Drive Gear - BRC 2000 Hydraulic Actuator - 3in Plug Valve
PV31502LTHA-A001	4	Plug Valve - 3in FIG 1502 MxF Low Torque Hydraulic Actuated Sour Service
PV3LTHA-BRC2K-A001	4	BRC 2000 Hydraulic Actuator for 3in Low Torque Plug Valves
BRC2KDG2-P001	1	Modified OEM Drive Gear - BRC 2000 Hydraulic Actuator - 3in Low Torque Plug Valve
PV2X11502PA-A001	3	Plug Valve - 2in x 1in FIG 1502 MxF Pneumatic Actuated Sour Service
PV2X1PA-A001	1	BRC 1000 Hydraulic Actuator for 2in x 1in Plug Valves
PV2X1PADG-P001	2	Pneumatic Actuator Drive Gear Adapter for 2in x 1in Valves
PV2X1PAMB-P001	1	Pneumatic Actuator Mounting Bracket for 2in x 1in Valves
PV21502PA-A001	3	Plug Valve - 2in FIG 1502 MxF Pneumatic Actuated Sour Service
PV2PA-A001	1	Pneumatic Actuator Assembly for 2in Valves
PV2PADG-P001	2	Pneumatic Actuator Drive Gear Adapter for 2in Valves
PV2PAMB-P001	1	Pneumatic Actuator Mounting Bracket for 2in Valves
PV21502LTPA-A001	3	Plug Valve - 2in FIG 1502 MxF Low Torque Pneumatic Actuated Sour Service
PV2PALT-A001	1	Pneumatic Actuator Assembly for 2in LT Valves
PV2PADGLT-P001	2	Pneumatic Actuator Drive Gear Adapter for 2in LT Valves & 3in Sour LT Valves
PV2PAMBLT-P001	1	Pneumatic Actuator Mounting Bracket for 2in LT Valves
PV31502PA-A001	3	Plug Valve - 3in FIG 1502 MxF Pneumatic Actuated Sour Service
PV31502LPPA-A001	2	Plug Valve - 3in FIG 1502 MxF Long Pattern Pneumatic Actuated Sour Service
PV3PA-A001	2	Pneumatic Actuator Assembly for 3in Valves Sour Service
PV3PADG-P001	3	Pneumatic Actuator Drive Gear Adapter for 3in Valves
PV31502LTPA-A001	3	Plug Valve - 3in FIG 1502 MxF Low Torque Pneumatic Actuated Sour Service
PV3PALT-A001	2	Pneumatic Actuator Assembly for 3in LT Valves Sour Service

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	1in – 4in Fig. 1502 Plug Valves Integral 10K Sour Service
-	-	1in – 4in Fig. 1502 Plug Valves Integral 10K Sour Service – actuated versions

Materials:

<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @ MDT</u>
MS-101 Rev. 8	4130	75 ksi	20 ft-lbf
MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
MS-107 Rev. 3	Non-Metallic Seals	-	-
MS-110 Rev. 0	Glass Filled PhenolicC	-	-
MS-116 Rev. 0	Nickel-Aluminum Bronze C95500	-	-

Note: (1) See part drawings for materials. (2) See material specifications for additional material requirements. (3) Charpy impact testing is not required on pressure controlling parts.

Job Id: **262.1-030622-1**
Certificate No: **TAD000012N**

Tests carried out

1. Plug Valve 3" Fig. 1502 Shell Test and Male/Female Seats Test.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. Pneumatic Actuators are covered under TAP00001M4.
3. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve**with type designation(s)
2" Fig. 1502 Pressure Relief Valve 15K Standard ServiceIssued to
Red Deer Ironworks Inc.
Red Deer, AB, Canadais found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Houston** on **2019-03-28**for **DNV GL**This Certificate is valid until **2024-02-29**.DNV GL local station: **Vancouver**Approval Engineer: **Xiangwen Maggie Wang**

Meindert van Mierlo
Head of Section

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.



Product description

- Pressure Relief Valve, 2" Fig 1502 MxF DET 15,000 psi Standard Services

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PRV21502STD-A001	2	Pressure Relief Valve 2in Fig 1502 MxF DET 15,000psi Standard Services
WNKIT21502STD-A001	3	Wing nut kit - 2in Fig 1502
WN215DETSTD-P001	5	Wing nut body
SEG21502-P001	7	Segment
PRV21502STD-P001	2	Body
TH-2in-1502-F	8	2in fig 1502 female end (thread end)
TH-2in-1502-M	7	2in fig 1502 male end (wing end)
PRV2ADJSCREWSTD-P001	1	Adjusting screw
PRV2BALL-P001	1	Ball
PRV2CAPSTD-P001	1	Cap
PRV2DISKSPRING-P001	1	Disk spring
PRV2KEEPER-P001	1	Keeper
PRV2SEALCAP-P001	1	Factory seal cap
PRV2SEAT-P001	2	Seat
PRV2SPIDERSTD-P001	1	Spider

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	2in Fig. 1502 Pressure Relief Valve 15K Standard Service

Materials:

<u>Part</u>	<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @ MDT</u>
Body & Wing nut	MS-104 Rev. 7	4130	100 ksi	20 ft-lbf
Adjusting screw & cap	MS-104 Rev. 7 /MS-105 Rev. 7	4130/4140	100 ksi/110 ksi	20 ft-lbf
Wing nut segment	MS-102 Rev. 5	4140	80 ksi	20 ft-lbf

Job Id: **262.1-030629-1**
Certificate No: **TAD000012Z**

Note: (1) See material specifications for additional material requirements. (2) Charpy impact testing is not required on pressure controlling parts.

Tests carried out

1. Test Report for Pressure Relief Valve 2" FIG 1502 X 1FT MXF Det Intergral Standard Service, S/N: 40702-7, dated Mar. 19th 2019.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Fitting**

with type designation(s)
2", 3" & 4" Fig. 1502 Pup Joints 10K Sour Service

Issued to

Red Deer Ironworks Inc.
Red Deer, AB, Canada

is found to comply with

DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Houston** on **2019-03-28**

for **DNV GL**

This Certificate is valid until **2024-03-27**.

DNV GL local station: **Vancouver**

Approval Engineer: **Xiangwen Maggie Wang**

Meindert van Mierlo
Head of Section

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.



Product description

- Pup Joints, 2", 3" & 4" Fig. 1502 10K Sour Service

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition
- ISO 15156 (all parts)/NACE MR0175, Petroleum and Natural Gas Industries – Materials for Use in H₂S-Containing Environments in Oil and Gas Production, 2nd Edition

Application/Limitation

- Max. Working Pressure: 10,000 psi
- Test Pressure: 15,000 psi
- Design Temperature: -50 °F to 250 °F
- Service: Sour
- Material Class: DD
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PJI215X8.22IN-A001	4	Pup Joint - 2in Fig. 1502 x 8.22in MxF Sour Service
PJI215X8.22IN-P001	4	Pup Joint - 2in Fig. 1502 x 8.22in MxF Sour Service
PJI215X8.22INT-A001	5	Pup Joint - 2in Fig. 1502 x 8.22in MxF 0.50in NPT TAP Sour Service
PJI215X8.22INT-P001	5	Pup Joint - 2in Fig. 1502 x 8.22in MxF 0.50in NPT TAP Sour Service
PJI215X13.88IN-A001	4	Pup Joint - 2in Fig. 1502 x 13.88in MxF Sour Service
PJI215X13.88IN-P001	4	Pup Joint - 2in Fig. 1502 x 13.88in MxF Sour Service
PJI215X13.88INT-A001	3	Pup Joint - 2in Fig. 1502 x 13.88in MxF 0.50in NPT TAP Sour Service
PJI215X13.88INT-P001	2	Pup Joint - 2in Fig. 1502 x 13.88in MxF 0.50in NPT TAP Sour Service
PJI215XXFT-A001	4	Pup Joint - 2in Fig. 1502 x Xft MxF Sour Service
PJI215XXFT-P001	5	Pup Joint - 2in Fig. 1502 x Xft MxF Sour Service
PJI315X15.00IN-A001	2	Pup Joint - 3in Fig. 1502 x 15in MxF Sour Service
PJI315X15.00IN-P001	2	Pup Joint - 3in Fig. 1502 x 15in MxF Sour Service
PJI315X15.00INT-A001	2	Pup Joint - 3in Fig. 1502 x 15in MxF 0.50in NPT TAP Sour Service
PJI315X15.00INT-P001	1	Pup Joint - 3in Fig. 1502 x 15in MxF 0.50in NPT TAP Sour Service
PJI315X15.69IN-A001	3	Pup Joint - 3in Fig. 1502 x 15.69in MxF Sour Service
PJI315X15.69IN-P001	3	Pup Joint - 3in Fig. 1502 x 15.69in MxF Sour Service
PJI315X15.69INT-A001	4	Pup Joint - 3in Fig. 1502 x 15.69in MxF 0.50in NPT TAP Sour Service
PJI315X15.69INT-P001	3	Pup Joint - 3in Fig. 1502 x 15.69in MxF 0.50in NPT TAP Sour Service
PJI315XXFT-A001	6	Pup Joint - 3in Fig. 1502 x Xft MxF Sour Service
PJI315XXFT-P001	6	Pup Joint - 3in Fig. 1502 x Xft MxF Sour Service
PJI415X19.48IN-A001	2	Pup Joint - 4in Fig. 1502 x 19.48in MxF Sour Service

Job Id: **262.1-030623-1**
 Certificate No: **TAD000013C**

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PJI415X19.48IN-P001	2	Pup Joint - 4in Fig. 1502 x 19.48in MxF Sour Service
PJI415X2FT-A001	4	Pup Joint - 4in Fig. 1502 x 2ft MxF Sour Service
PJI415X2FT-P001	3	Pup Joint - 4in Fig. 1502 x 2ft MxF Sour Service
PJI415X3FT-A001	3	Pup Joint - 4in Fig. 1502 x 3ft MxF Sour Service
PJI415X3FT-P001	4	Pup Joint - 4in Fig. 1502 x 3ft MxF Sour Service
PJI415X3FTFXF-A001	3	Pup Joint - 4in Fig. 1502 x 3ft FxF Sour Service
PJI415X3FTFXF-P001	4	Pup Joint - 4in Fig. 1502 x 3ft FxF Sour Service
WNKIT21502-A001	3	Wing Nut Kit - 2in Fig. 1502 Sour Service
WNKIT31502-A001	3	Wing Nut Kit - 3in Fig. 1502 Sour Service
WNKIT41502-A001	4	Wing Nut Kit - 4in Fig. 1502 Sour Service
TH-2in-1502-F	8	Thread - 2in 1502 Female
TH-2in-1502-M	7	Thread - 2in 1502 Male
TH-3in-1502-F	9	Thread - 3in 1502 Female
TH-3in-1502-M	11	Thread - 3in 1502 Male
TH-4in-1502-F	6	Thread - 4in 1502 Female
TH-4in-1502-M	8	Thread - 4in 1502 Male
SEG21502-P001	7	SEGMENT SET - 2in 1502
SEG31502-P001	8	SEGMENT SET - 3in 1502
SEG41502-P001	7	SEGMENT SET - 4in 1502 Sour Service
WN21502-P001	7	Wing Nut - 2in Fig. 1502 Sour Service
WN31502-P001	7	Wing Nut - 3in Fig. 1502 Sour Service
WN415DET-P001	8	Wing Nut - 4in Fig. 1502 Sour Service

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	2in – 4in Fig. 1502 Pup Joints 10K Sour Service

Materials:

<u>Part</u>	<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @-50 °F</u>
Wingnut Body	MS-101 Rev. 8	4130	75 ksi	20 ft-lbf
Segment Body	MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
Pup Joint Body	MS-101 Rev. 8 /MS-102 Rev. 5	4130/4140	75/80 ksi	20 ft-lbf
Pup Joint Body (PJI215XXFT-P001 & PJI315XXFT-P001)	MS-101 Rev. 8	4130	75 ksi	20 ft-lbf
Union Seal	MS-107 Rev. 3	HSN/HNBR 80D	-	-

Note: (1) See material specifications for additional material requirements.



Job Id: **262.1-030623-1**
Certificate No: **TAD000013C**

Tests carried out

1. Test Report for Pup Joint 3" FIG 1502 X 1FT MXF Det Intergral Standard Service, S/N: 39508-4, dated Mar. 19th 2019.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve**

with type designation(s)

1", 2"x1", 2", 3" & 4" Fig. 1502 Plug Valves Integral 15K Standard Service

Issued to

Red Deer Ironworks Inc.**Red Deer, AB, Canada**

is found to comply with

DNVGL-OS-E101 – Drilling facilities, Edition January 2018**DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Houston** on **2019-03-27**for **DNV GL**This Certificate is valid until **2024-03-26**.DNV GL local station: **Vancouver**Approval Engineer: **Xiangwen Maggie Wang**

Meindert van Mierlo
Head of Section

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.



Product description

- 1", 2"x1", 2", 3" & 4" Fig. 1502 Plug Valves Integral 15K Sour Service
- 1", 2"x1", 2", 3" & 4" Fig. 1502 Plug Valves Integral 15K Sour Service – Actuated Versions

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 10,000 psi
- Test Pressure: 15,000 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PV11502STD-A001	3	Plug Valve - 1in Fig 1502 MxF Standard Service
PV11502ACTSTD-A001	7	Plug Valve - 1in Fig 1502 MxF (Actuator Prepared) Standard Service
PV2X11502STD-A001	7	Plug Valve - 2in X 1in Fig 1502 Standard Service
PV2X11502STDA-A001	1	Plug Valve - 2in X 1in Fig 1502 Acid & Standard Service
PV2X11502ACTSTD-A001	6	Plug Valve - 2in X 1in Fig 1502 MxF (Actuator Prepared) Standard Service
PV21502STD-A001	5	Plug Valve - 2in Fig 1502 MxF Standard Service
PV21502STDA-A001	1	Plug Valve - 2in Fig 1502 MxF Acid & Standard Service
PV21502APSTD-A001	5	Plug Valve - 2in Fig 1502 MxF (Actuator Prepared) Standard Service
PV21502LTSTD-A001	6	Plug Valve - 2in Fig 1502 MxF Low Torque Standard Service
PV21502LTAPSTD-A001	2	Plug Valve - 2in Fig 1502 MxF Low Torque (Actuator Prepared) Standard Service
PV31502STD-A001	7	Plug Valve - 3in Fig 1502 MxF Standard Service
PV31502APSTD-A001	2	Plug Valve - 3in Fig 1502 MxF (Actuator Prepared) Standard Service
PV31502GOSTD-A001	6	Plug Valve - 3in Fig 1502 MxF Gear Operated Standard Service
PV31502DGOSTD-A001	6	Plug Valve - 3in Fig 1502 MxF Gear Operated Standard Service
PV31502LPSTD-A001	3	Plug Valve - 3in Fig 1502 MxF Long Pattern Standard Service
PV31502LPAPSTD-A001	3	Plug Valve - 3in Fig 1502 MxF Long Pattern (Actuator Prepared) Standard Service
PV31502LPGOSTD-A001	5	Plug Valve - 3in Fig 1502 MxF Long Pattern Gear Operated Standard Service
PV31502LPDGOSTD-A001	3	Plug Valve - 3in Fig 1502 MxF Long Pattern Gear Operated Standard Service
PV31502LTSTD-A001	3	Plug Valve - 3in Fig 1502 MxF Low Torque Standard Service
PV31502LTAPSTD-A001	1	Plug Valve - 3in Fig 1502 MxF Low Torque (Actuator Prepared) Standard Service
PV31502LTGOSTD-	4	Plug Valve - 3in Fig 1502 MxF Low Torque Gear Operated

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
A001		Standard Service
PV41502STD-A001	7	Plug Valve - 4in Fig 1502 MxF Standard Service
PV41502GOSTD-A001	7	Plug Valve - 4in Fig 1502 MxF Gear Operated Standard Service
WNKIT11502STD-A001	2	Wingnut Kit - 1in Fig 1502 Standard Service
WNKIT21502STD-A001	3	Wingnut Kit - 2in Fig 1502 Standard Service
WNKIT31502STD-A001	5	Wingnut Kit - 3in Fig 1502 Standard Service
WNKIT41502STD-A001	4	Wingnut Kit - 4in Fig 1502 Standard Service
PV11502STD-P001	4	Plug Valve - 1in Fig 1502 MxF Standard Service
PV11502ACTSTD-P001	1	Plug Valve - 1in Fig 1502 MxF (Actuator Prepared) Standard Service
TH-1in-1502-F	3	Thread - 1in 1502 Female
TH-1in-1502-M	3	Thread - 1in 1502 Male
PV2X11502STD-P001	8	Plug Valve - 2in X 1in Fig 1502 Standard Service
PV2X11502ACTSTD-P001	2	Plug Valve - 2in X 1in Fig 1502 (Actuator Prepared) Standard Service
TH-2in-1502-F	8	Thread - 2in 1502 Female
TH-2in-1502-M	7	Thread - 2in 1502 Male
PV115BODCAPSTD-P001	3	Body Cap - 1in Fig 1502 Standard Service
PV115FINPLUG-P001	7	Plug - 1in Fig 1502 Plug Valve
PV115FINSEATCARR-P001	13	Seat Carrier - 1in Fig 1502 Plug Valve
PV115SPACER-P001	4	Seat Spacer - 1in Fig 1502 Plug Valve
PV1ORSEALA-A001	1	Plug Seal - 1in Plug (Viton O-Ring)
PV1ORSEALV-A001	2	Plug Seal - 1in Plug
PV1ORSEALV-P001	2	Plug Seal Backup Ring - 1in Plug
PVHD1X11502-P001	4	Handle - 1in Fig 1502 Plug Valve
PV115HDLSTOP-P001	3	Stop Plate - 1in Fig 1502 Plug Valve
SEG11502-P001	1	Segment Set - 1in 1502
WN11502-P001	3	Wingnut - 1in Fig 1502
SEG21502-P001	7	Segment Set - 2in 1502
WN215DETSTD-P001	5	Wingnut - 2in Fig 1502 Standard Service
PV21502STD-P001	8	Plug Valve - 2in Fig 1502 MxF Standard Service
PV21502APSTD-P001	2	Plug Valve - 2in Fig 1502 MxF (Actuator Prepared) Standard Service
PV215BODCAPSTD-P001	3	Body Cap - 2in Fig 1502 Plug Valve Standard Service
PV215FINPLUG-P001	9	Plug - 2in Plug Valve
PV215FINSEATCARR-P001	14	Seat Carrier - 2in Fig 1502 Plug Valve
PV2X2SPACERGLASSPHEN-P001	2	Seat Spacer - 2in Fig 1502 Plug Valve
PV2602ORSEAL-A001	2	Plug Seal - 2in Plug
PV2602ORSEALA-A001	1	Plug Seal - 2in Plug (Viton O-Ring)
PV2602ORSEAL-P001	2	Back Up Ring - 2in Plug Seal
PVHDL2X2-P001	4	Handle - 2in Fig 1502 Plug Valve
PV215HDLSTOP-P001	4	Stop Plate - 2in Fig 1502 Plug Valve
PV21502LTSTD-P001	11	Plug Valve - 2in Fig 1502 MxF Low Torque Standard Service

Job Id: **262.1-030626-1**
Certificate No: **TAD000013G**

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PV21502LTAPSTD-P001	3	Plug Valve - 2in Fig 1502 MxF Low Torque (Actuator Prepared) Standard Service
PV215BODCAPLTSTD-P001	4	Body Cap - 2in Fig 1502 Low Torque Plug Valve Standard Service
PV215FINPLUGLTSTD-P001	5	Plug - 2in Low Torque Plug Valve Standard Service
PV215FINSEATCARRLTSTD-P001	3	Seat Carrier - 2in Fig 1502 Low Torque Plug Valve Standard Service
PVRK2LTMINA-A001	1	Minor Repair Kit - 2in Fig 1502 Low Torque Plug Valve Acid & Standard Service
PVRK2LTMINSTD-A001	2	Minor Repair Kit - 2in Fig 1502 Low Torque Plug Valve Standard Service
PVHDL2X2LT-P001	2	Handle - 2in Fig 1502 Low Torque Plug Valve
PV215HDLSTOPLT-P001	1	Stop Plate - 2in Fig 1502 Low Torque Plug Valve
PV31502STD-P001	7	Plug Valve - 3in Fig 1502 MxF Standard Service
PV31502APSTD-P001	2	Plug Valve - 3in Fig 1502 MxF (Actuator Prepared) Standard Service
PV31502LPSTD-P001	4	Plug Valve - 3in Fig 1502 MxF Long Pattern Standard Service
PV31502LPAPSTD-P001	1	Plug Valve - 3in Fig 1502 MxF Long Pattern (Actuator Prepared) Standard Service
TH-3in-1502-F	9	Thread - 3in 1502 Female
TH-3in-1502-M	11	Thread - 3in 1502 Male
PV36BODCAPSTD-P001	5	Cap - 3in Standard Service
PV36BODCAPLPSTD-P001	2	Cap - 3in Long Pattern Standard Service
PV3FINPLUG-P001	11	Plug - 3in Plug Valve
PV3FINSEATCARR-P001	11	Seat Carrier - 3in Plug Valve
PV3SPACERGLASSPHE NOLIC-P001	2	Seat Carrier Spacer - 3in Plug Valve
PV3PLUGSEALS-A001	3	Plug Seals - 3in Plug
PV3PLUGSEALSA-A001	2	Plug Seals - 3in Plug (Viton O-Ring)
PV3PLUGSEALS-P001	3	Back Up Ring - 3in Plug Seal
PV3HANDLE-P001	3	Handle - 3in And 4in Plug Valve
PV3HDLSTOP-P001	3	Stop Plate - 3in Fig 206, 602 And 1502 Plug Valve
SEG31502-P001	8	Segment Set - 3in 1502
WN315DETSTD-P001	8	Wingnut - 3in Fig 1502 Standard Service
PV31502LTSTD-P001	5	Plug Valve - 3in Fig 1502 MxF Low Torque Standard Service
PV31502LTAPSTD-P001	2	Plug Valve - 3in Fig 1502 MxF Low Torque (Actuator Prepared) Standard Service
PV315BODCAPLTSTD-P001	1	Body Cap - 3in Fig 1502 Low Torque Plug Valve Standard Service
PV315FINPLUGLTSTD-P001	3	Plug - 3in Low Torque Plug Valve Standard Service
PV315FINSEATCARRLTSTD-P001	3	Seat Carrier - 3in Fig 1502 Low Torque Plug Valve Standard Service

Job Id: **262.1-030626-1**
Certificate No: **TAD000013G**

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PVRK3LTMINSTD-A001	4	Minor Repair Kit - 3in Fig 1502 Low Torque Plug Valve Standard Service
PV41502STD-P001	12	Plug Valve - 4in Fig 1502 MxF Standard Service
TH-4in-1502-F	6	Thread - 4in 1502 Female
TH-4in-1502-M	8	Thread - 4in 1502 Male
PV4BODCAPSTD-P001	3	Cap - 4in Standard Service
PV4PLUG-P001	5	Plug - 4in Plug Valve
PV4SEATCARR-P001	7	Seat Carrier - 4in Plug Valve
PV4SPACER-P001	2	Seat Carrier Spacer - 4in Plug Valve
PV4PLUGSEALS-A001	4	Plug Seals - 4in Plug
PV4PLUGSEALS-P001	3	Plug Seal Backup Ring - 4in Plug
PV4HDLSTOP	3	Stop Plate - 4in Fig 1002 And 1502 Plug Valve
SEG415STD-P001	5	Segment Set - 4in 1502 Standard Service
WN415DETSTD-P001	8	Wingnut - 4in Fig 1502 Standard Service
PV11502HASTD-A001	3	Plug Valve - 1in Fig 1502 MxF Hydraulic Actuated Standard Service
PV2X11502HASTD-A001	4	Plug Valve - 2in X 1in Fig 1502 MxF Hydraulic Actuated Standard Service
PV2X1HA-BRC1K-A001	4	BRC 1000 Hydraulic Actuator For 2in X 1in Plug Valves
BRC1KDG1-P001	1	Modified OEM Drive Gear - BRC 1000 Hydraulic Actuator - 2in, 2in Lt & 2in X 1in Plug Valves
BRC1KDG3-P001	2	Drive Gear Adaptor - 2in Plug Valve
BRC1K2X1PVMP-P001	1	Modified OEM Mounting Plate - BRC 1000 Hydraulic Actuator - 2in X 1in Plug Valve
PV21502HASTD-A001	4	Plug Valve - 2in Fig 1502 MxF Hydraulic Actuated Standard Service
PV2HA-BRC1K-A001	4	BRC 1000 Hydraulic Actuator For 2in Plug Valves
BRC1KDG2-P001	2	Drive Gear Adaptor - 2in X 1in Plug Valve
BRC1K2PVMP-P001	1	Modified OEM Mounting Plate - BRC 1000 Hydraulic Actuator - 2in Plug Valve
PV21502LTHASTD-A001	4	Plug Valve - 2in Fig 1502 MxF Low Torque Hydraulic Actuated Standard Service
PV2LTHA-BRC1K-A001	3	BRC 1000 Hydraulic Actuator For 2in Low Torque Plug Valves
BRC1K2LTPVMP-P001	1	Modified OEM Mounting Plate - BRC 1000 Hydraulic Actuator - 2in Low Torque Plug Valve
PV31502HASTD-A001	5	Plug Valve - 3in Fig 1502 MxF, Hydraulic Actuated, Standard Service
PV31502LPHASTD-A001	4	Plug Valve - 3in Fig 1502 MxF Long Pattern, Hydraulic Actuated, Standard Service
PV3HA-BRC2K-A001	4	BRC 2000 Hydraulic Actuator For 3in Plug Valves
BRC2K3PVMP-P001	1	Modified OEM Mounting Plate - BRC 2000 Hydraulic Actuator - 3in Plug Valve
BRC2KDG1-P001	1	Modified OEM Drive Gear - BRC 2000 Hydraulic Actuator - 3in Plug Valve
PV31502LTHASTD-A001	4	Plug Valve - 3in Fig 1502 MxF Low Torque Hydraulic Actuated Standard Service
PV3LTHA-BRC2K-A001	4	BRC 2000 Hydraulic Actuator For 3in Low Torque Plug Valves
BRC2KDG2-P001	1	Modified OEM Drive Gear - BRC 2000 Hydraulic Actuator - 3in

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
		Low Torque Plug Valve
PV2X11502PASTD-A001	3	Plug Valve - 2in X 1in Fig 1502 MxF Pneumatic Actuated Standard Service
PV2X1PA-A001	1	BRC 1000 Hydraulic Actuator For 2in X 1in Plug Valves
PV2X1PADG-P001	2	Pneumatic Actuator Drive Gear Adaptor For 2in X 1in Valves
PV2X1PAMB-P001	1	Pneumatic Actuator Mounting Bracket For 2in X 1in Valves
PV21502PASTD-A001	3	Plug Valve - 2in Fig 1502 MxF Pneumatic Actuated Standard Service
PV2PA-A001	1	Pneumatic Actuator Assembly For 2in Valves
PV2PADG-P001	2	Pneumatic Actuator Drive Gear Adaptor For 2in Valves
PV2PAMB-P001	1	Pneumatic Actuator Mounting Bracket For 2in Valves
PV21502LTPASTD-A001	3	Plug Valve - 2in Fig 1502 MxF Low Torque Pneumatic Actuated Standard Service
PV2PALT-A001	1	Pneumatic Actuator Assembly For 2in Lt Valves
PV2PADGLT-P001	2	Pneumatic Actuator Drive Gear Adaptor For 2in Lt Valves & 3in Sour Lt Valves
PV2PAMBLT-P001	1	Pneumatic Actuator Mounting Bracket For 2in Lt Valves
PV31502LPPASTD-A001	2	Plug Valve - 3in Fig 1502 MxF Long Pattern Pneumatic Actuated Standard Service
PV31502PASTD-A001	4	Plug Valve - 3in Fig 1502 MxF Pneumatic Actuated Standard Service
PV3PASTD-A001	2	Pneumatic Actuator Assembly For 3in Valves Standard Service
PV3PADG-P001	3	Pneumatic Actuator Drive Gear Adaptor For 3in Valves
PV31502LTPASTD-A001	4	Plug Valve - 3in Fig 1502 MxF Low Torque Pneumatic Actuated Standard Service
PV3PALTSTD-A001	2	Pneumatic Actuator Assembly For 3in Lt Valves Standard Service

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	1in – 4in Fig. 1502 Plug Valves Integral 15K Sour Service
-	-	1in – 4in Fig. 1502 Plug Valves Integral 15K Sour Service – actuated versions

Materials:

<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @ MDT</u>
MS-101 Rev. 8	4130	75 ksi	20 ft-lbf
MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
MS-104 Rev. 7	4130	100 ksi	20 ft-lbf
MS-105 Rev. 7	4140_4150	110 ksi	20 ft-lbf
MS-107 Rev. 3	Non-Metallic Seals	-	-
MS-110 Rev. 0	Glass Filled PhenolicC	-	-
MS-115 Rev. 0	Ductile Iron 55K	55 ksi	-

Job Id: **262.1-030626-1**
Certificate No: **TAD000013G**

Note: (1) See part drawings for materials. (2) See material specifications for additional material requirements. (3) Charpy impact testing is not required on pressure controlling parts.

Tests carried out

1. Plug Valve 3" Fig. 1502 Shell Test and Male/Female Seats Test.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. Pneumatic Actuators are covered under TAP00001M4.
3. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve**with type designation(s)
2" & 3" Fig. 1502 Swing Check Valve 15KIssued to
Red Deer Ironworks Inc.
Red Deer, AB, Canadais found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Houston** on **2019-03-28**for **DNV GL**This Certificate is valid until **2024-03-27**.DNV GL local station: **Vancouver**Approval Engineer: **Xiangwen Maggie Wang**

Meindert van Mierlo
Head of Section

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.



Product description

- Swing Check Valve, 2" & 3" Fig 1502 15,000 psi Standard Service

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
SC21502STD-A001	7	Swing check valve - 2in fig 1502 standard flow standard service
WNKIT21502STD-A001	3	Wingnut kit - 2in fig 1502 standard service
SC31502TESTD-A001	5	Swing check valve top entry - 3in fig 1502 standard service
WNKIT31502STD-A001	5	Wingnut kit - 3in fig 1502 standard service
CV215STDBODF-P001	5	Female sub body - 2in 1502 swing check valve standard service
TH-2in-1502-F	8	Thread - 2in 1502 female
CV215STDBODM-P001	6	Male sub body - 2in 1502 swing check valve standard service
TH-2in-1502-M	7	Thread - 2in 1502 male
CV215CLAP-P001	5	Clapper - 2in swing check valve
CV215SEATCARR-P001	5	Seat carrier - 2in swing check valve
SEG21502-P001	7	Segment set - 2in 1502
WN215DETSTD-P001	5	Wingnut - 2in fig 1502 standard service
SC31502TESTD-P001	6	Swing check valve top entry - 3in fig 1502 standard service
TH-3in-1502-F	9	Thread - 3in 1502 female
TH-3in-1502-M	11	Thread - 3in 1502 male
SCTE3CAPSTD-P001	3	Cap - 3in swing check valve top entry
SCTE3CLAPFIN-P001	2	Coated clapper - 3in swing check valve top entry
SCTE3CLAPPER-P001	3	Clapper - 3in swing check valve top entry
SCTE3HANGER-P001	5	Hanger - 3in swing check valve top entry
SEG31502-P001	8	Segment set - 3in 1502
WN315DETSTD-P001	8	Wingnut - 3in fig 1502 standard service

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	2in-3in Fig. 1502 Swing Check Valve 15K Standard Service

Job Id: **262.1-030630-1**
Certificate No: **TAD0000131**

Materials:

<u>Part</u>	<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @ MDT</u>
<i>2" Swing Valve</i>				
Wing nut	MS-104 Rev. 7	4130	100 ksi	20 ft-lbf
Segment	MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
Female/male sub, Body	MS-104 Rev. 7 /MS-105 Rev. 7	4130/4140	100 ksi/110 ksi	20 ft-lbf
Seat, clapper	MS-101/MS-102	4130/4140	75 ksi/80 ksi	-
<i>3" Swing Valve</i>				
Wing nut	MS-104 Rev. 7	4130	100 ksi	20 ft-lbf
Segment	MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
Body & cap	MS-104 Rev. 7 /MS-105 Rev. 7	4130/4140	100 ksi/110 ksi	20 ft-lbf
Clapper	MS-118 Rev. 0	17-4 PH (CB7Cu-1)	97 ksi	-
Clapper hanger	MS-118 Rev. 0	17-4 PH (CB7Cu-1)	97 ksi	-
	MS-101 Rev. 8/ MS-102 Rev. 5	4130/4140	75 ksi/80 ksi	

Note: (1) See material specifications for additional material requirements. (2) Charpy impact testing is not required on pressure controlling parts.

Tests carried out

1. Test Report for Swing Check Valve 3" FIG 1502 Reverse Flow MXF Det Intergral Standard Service, S/N: 34401-3, dated Mar. 19th 2019.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Coupling**

with type designation(s)
2" & 3" Fig. 1502 Swivel Joints 15K Standard Service

Issued to
Red Deer Ironworks Inc.
Red Deer, AB, Canada

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Houston** on **2019-03-28**

for **DNV GL**

This Certificate is valid until **2024-03-27**.

DNV GL local station: **Vancouver**

Approval Engineer: **Xiangwen Maggie Wang**

Meindert van Mierlo
Head of Section

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.



Product description

- Swivel Joint, 2" & 3" Fig 1502 15,000 psi Standard Service

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
SJL215S10MFSTD-A001	4	Swivel assembly - 2in fig 1502 style 10 mxf std service
SJL215S10MMSTD-A001	3	Swivel assembly - 2in fig 1502 style 10 mxm std service
SJL215S20MFSTD-A001	4	Swivel assembly - 2in fig 1502 style 20 mxf std service
SJL215S30MFSTD-A001	4	Swivel assembly - 2in fig 1502 style 30 mxf std service
SJL215S50MFSTD-A001	4	Swivel assembly - 2in fig 1502 style 50 mxf std service
SJL215S60MFSTD-A001	1	Swivel assembly - 2in fig 1502 style 60 mxf std service
SJL215S60MMSTD-A001	1	Swivel assembly - 2in fig 1502 style 60 mxm std service
SJL215S80MFSTD-A001	4	Swivel assembly - 2in fig 1502 style 80 mxf std service
SJL215S100MFSTD-A001	3	Swivel assembly - 2in fig 1502 style 100 mxf std service
WNKIT21502STD-A001	3	Wingnut kit - 2in fig 1502 std service
SJL315S10MFSTD-A001	4	Swivel assembly - 3in fig 1502 style 10 mxf std service
SJL315S10MMSTD-A001	3	Swivel assembly - 3in fig 1502 style 10 mxm std service
SJL315S20MFSTD-A001	3	Swivel assembly - 3in fig 1502 style 20 mxf std service
SJL315S20MMSTD-A001	1	Swivel assembly - 3in fig 1502 style 20 mxm std service
SJL315S30MFSTD-A001	4	Swivel assembly - 3in fig 1502 style 30 mxf std service
SJL315S50MFSTD-A001	4	Swivel assembly - 3in fig 1502 style 50 mxf std service
SJL315S60MFSTD-A001	1	Swivel assembly - 3in fig 1502 style 60 mxf std service
SJL315S60MMSTD-A001	1	Swivel assembly - 3in fig 1502 style 60 mxm std service
SJL315S80MFSTD-A001	4	Swivel assembly - 3in fig 1502 style 80 mxf std service
WNKIT31502STD-A001	5	Wingnut kit - 3in fig 1502 std service
SWVEL215FSTD-P001	1	Swivel elbow - 2in fig 1502 f x 2in bg 1502 m std service
SWVEL215STD-P001	2	Swivel elbow - 2in bg 1502 mxf std service
SWVSTR215FSTD-P001	1	Swivel straight - 2in fig 1502 f x 2in bg 1502 m std service
SWVSTR215MSTD-P001	2	Swivel straight - 2in bg 1502 f x 2in fig 1502 m std service
SWVSTR215MxMSTD-P001	2	Swivel straight - 2in bg 1502 m x 2in fig 1502 m std service
BG-2in-1502-F	4	2.0in bg 1502 - female end
BG-2in-1502-M	1	2.0in bg 1502 - male end
TH-2in-1502-F	8	Thread - 2in 1502 female
TH-2in-1502-M	7	Thread - 2in 1502 male
SWV215QTCSTD-P001	2	Swivel qualification test coupon - 2in swivel std service
SEG21502-P001	7	Segment set - 2in 1502
WN215DETSTD-P001	5	Wingnut - 2in fig 1502 std service
SWVEL315FSTD-P001	1	Swivel elbow - 3in fig 1502 f x 3in bg 1502 m std service
SWVEL315STD-P001	2	Swivel elbow - 3in bg 1502 mxf std service

Job Id: **262.1-030628-1**
Certificate No: **TAD0000132**

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
SWVSTRT315FSTD-P001	1	Swivel straight - 3in fig 1502 f x 3in bg 1502 m std service
SWVSTRT315MSTD-P001	2	Swivel straight - 3in bg 1502 f x 3in fig 1502 m std service
SWVSTRT315MxMSTD-P001	2	Swivel straight - 3in bg 1502 m x 3in fig 1502 m std service
BG-3in-1502-F	4	3.0in bg 1502 - female end
BG-3in-1502-M	2	3.0in bg 1502 - male end
TH-3in-1502-F	9	Thread - 3in 1502 female
TH-3in-1502-M	11	Thread - 3in 1502 male
SWV315QTCSTD-P001	2	Swivel qualification test coupon - 3in swivel std service
SEG31502-P001	8	Segment set - 3in 1502
WN315DETSTD-P001	8	Wingnut - 3in fig 1502 std service

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	2in-3in Fig. 1502 Swivel Joint 15K Standard Service

Materials:

<u>Part</u>	<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @ MDT</u>
Segment	MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
Wing nut	MS-104 Rev. 7	4130	100 ksi	20 ft-lbf
Swivel elbow/straight	MS-121 Rev. 0	4715	95 ksi	20 ft-lbf

Note: (1) See material specifications for additional material requirements.

Tests carried out

1. Test Report for Swivel Radius 3" FIG 1502 Style 50 Swivel MXF Det Intergral Standard Service, S/N: 38157-12, dated Mar. 19th 2019.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Fitting**

with type designation(s)
2", 3" & 4" Fig. 1502 Pup Joints Integral 15K Standard Service

Issued to
Red Deer Ironworks Inc.
Red Deer, AB, Canada

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Houston** on **2019-03-13**

for **DNV GL**

This Certificate is valid until **2024-03-12**.

DNV GL local station: **Vancouver**

Approval Engineer: **Xiangwen Maggie Wang**

Meindert van Mierlo
Head of Section

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.



Product description

- Pup Joints, 2", 3" & 4" Fig. 1502 15K Integral Standard Service

Reference standards

- API 6A, Wellhead and Christmas Tree Equipment, 20th Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Design Temperature: -20 °F to 250 °F
- Service: Standard
- Material Class: AA
- Product Specification Level: 1
- Performance Requirement: 1

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PJI215X8.22INSTD-A001	5	Pup Joint - 2in Fig 1502 X 8.22in MxF Standard Service
PJI215X8.22INSTD-P001	4	Pup Joint - 2in Fig 1502 X 8.22in MxF Standard Service
PJI215X8.22INTSTD-A001	3	Pup Joint - 2in Fig 1502 x 8.22in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI215X8.22INTSTD-P001	2	Pup Joint - 2in Fig 1502 x 8.22in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI215X13.88INSTD-A001	4	Pup Joint - 2in Fig 1502 x 13.88in MxF Standard Service
PJI215X13.88INSTD-P001	3	Pup Joint - 2in Fig 1502 x 13.88in MxF Standard Service
PJI215X13.88INTSTD-A001	3	Pup Joint - 2in Fig 1502 x 13.88in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI215X13.88INTSTD-P001	2	Pup Joint - 2in Fig 1502 x 13.88in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI215XXFTSTD-A001	5	Pup Joint - 2in Fig 1502 x Xft MxF Standard Service
PJI215XXFTSTD-P001	4	Pup Joint - 2in Fig 1502 x Xft MxF Standard Service
PJI315X15.00INSTD-A001	3	Pup Joint - 3in Fig 1502 x 15.00in MxF Standard Service
PJI315X15.00INSTD-P001	2	Pup Joint - 3in Fig 1502 x 15.00in MxF Standard Service
PJI315X15.00INTSTD-A001	2	Pup Joint - 3in Fig 1502 x 15.00in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI315X15.00INTSTD-P001	2	Pup Joint - 3in Fig 1502 x 15.00in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI315X15.69INSTD-A001	4	Pup Joint - 3in Fig 1502 x 15.69in MxF Standard Service
PJI315X15.69INSTD-P001	3	Pup Joint - 3in Fig 1502 x 15.69in MxF Standard Service
PJI315X15.69INTSTD-A001	4	Pup Joint - 3in Fig 1502 x 15.69in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI315X15.69INTSTD-P001	4	Pup Joint - 3in Fig 1502 x 15.69in MxF 0.5625in High Pressure Autoclave Tap Standard Service
PJI315XXFTSTD-A001	5	Pup Joint - 3in Fig 1502 x Xft MxF Standard Service
PJI315XXFTSTD-P001	4	Pup Joint - 3in Fig 1502 x Xft MxF Standard Service
PJI415X19.48INSTD-A001	3	Pup Joint - 4in Fig 1502 x 19.48in MxF Standard Service
PJI415X19.48INSTD-P001	2	Pup Joint - 4in Fig 1502 x 19.48in MxF Standard Service

Job Id: **262.1-030627-1**
 Certificate No: **TAD0000136**

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>
PJI415X2FTSTD-A001	3	Pup Joint - 4in Fig 1502 x 2ft MxF Standard Service
PJI415X2FTSTD-P001	2	Pup Joint - 4in Fig 1502 x 2ft MxF Standard Service
PJI415X3FTSTD-A001	4	Pup Joint - 4in Fig 1502 x 3ft MxF Standard Service
PJI415X3FTSTD-P001	3	Pup Joint - 4in Fig 1502 x 3ft MxF Standard Service
PJI415X3FTFXFSTD-A001	2	Pup Joint - 4in Fig 1502 x 3ft FxF Standard Service
PJI415X3FTFXFSTD-P001	2	Pup Joint - 4in Fig 1502 x 3ft FxF Standard Service
WKNIT21502STD-A001	3	Wingnut KIT - 2in Fig 1502 Standard Service
WKNIT31502STD-A001	5	Wingnut KIT - 3in Fig 1502 Standard Service
WKNIT41502STD-A001	4	Wingnut KIT - 4in Fig 1502 Standard Service
TH-0.5625in-AC-HP-F562C	2	Thread - 0.5625in Auto-Clave High Pressure (F5625C)
TH-2in-1502-F	8	Thread - 2in 1502 Female
TH-2in-1502-M	7	Thread - 2in 1502 Male
TH-3in-1502-F	9	Thread - 3in 1502 Female
TH-3in-1502-M	11	Thread - 3in 1502 Male
TH-4in-1502-F	6	Thread - 4in 1502 Female
TH-4in-1502-M	8	Thread - 4in 1502 Male
SEG21502-P001	7	Segment Set - 2in 1502
SEG31502-P001	8	Segment Set - 3in 1502
SEG415STD-P001	5	Segment Set - 4in 1502 Standard Service
WN215DETSTD-P001	5	Wingnut - 2in Fig 1502 Standard Service
WN315DETSTD-P001	8	Wingnut - 3in Fig 1502 Standard Service
WN415DETSTD-P001	8	Wingnut - 4in Fig 1502 Standard Service

Note: Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
-	-	2in – 4in Fig. 1502 Pup Joints Integral 15K Standard Service & extra calc. submitted 3/4/2019

Materials:

<u>Part</u>	<u>Material Spec.</u>	<u>Description</u>	<u>Min. Yield</u>	<u>Req'd Charpy @ MDT</u>
Wing nut	MS-104 Rev. 7	4130	100 ksi	20 ft-lbf
Segment	MS-102 Rev. 5	4140	80 ksi	20 ft-lbf
Segment (SEG415STD-P001)	MS-105 Rev. 7	4140	110 ksi	20 ft-lbf
Pup Joint Body	MS-104 Rev. 7/ MS-105 Rev. 7	4130/4140	100 ksi/110 ksi	20 ft-lbf
Pup Joint Body (PJI215XXFTSTD-P001, PJI315XXFTSTD-P001)	MS-104 Rev. 7	4130	100 ksi	20 ft-lbf

Note: (1) See material specifications for additional material requirements.

Job Id: **262.1-030627-1**
Certificate No: **TAD0000136**

Tests carried out

1. Test Report for Pup Joint 3" FIG 1502 X 1FT MXF Det Intergral Standard Service, S/N: 39508-4, dated Mar. 19th 2019.

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform periodical assessment after 2 years and after 3.5 years in accordance with DNV GL's Class Programme DNVGL-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
2. DNV GL ref.: A0640768

END OF CERTIFICATE