DNV·GL

Certificate No:
TAD000011Y

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve

with type designation(s)
Valves

Issued to
FMC Technologies Inc. - Fluid Control
Houston, TX, USA

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 :

See Page 2

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

This Type Approval is 4 pages long and replaces D-5856, as issued on 2014-12-15.

Issued at **Houston** on **2019-05-31**
This Certificate is valid until **2024-05-30**.
DNV GL local station: **Houston - Systems & Components**

Approval Engineer: **M. Kevin Mandeville Jr.**

for **DNV GL**

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.

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Job Id: **262.1-005941-12**
Certificate No: **TAD000011Y**

Product description

1'' x 2'' ULT150 Plug Valve with 2'' Figure 1502 Integral Wing Union Ends
P/N P516108 (Std. Service)
P/N P516208 (Sour Service)
P/N P516143 (f/ operator, Std. Service)
1'' x 2'' ULT150 Plug Valve with 2'' Figure 1502 Integral Wing Union Ends, 0.38'' Bore
P/N P516146 (Std. Service)
P/N P516147 (f/ operator, Std. Service)
1" ULT150 Plug Valve with 1" Figure 1502 Integral Union Ends
P/N P516114 (Std. Service)
2" DR150 Plug Valve with 2" Figure 1502 Integral Union Ends
P/N P556461 (Std. Service)
2" DR150 Plug Valve w/ 2-1/16'' 10K psi 6BX152 API Flanged Ends
P/N P509364 (Sour Service)
P/N P522432 (f/ operator, Sour Service)
2'' DR150 Plug Valve w/ 2-1/16'' 10K psi 6BX152 API Flanged Ends x 2" Fig 1502 Female Sub End
P/N P509358 (Sour Service)
P/N P536525 (f/ operator, Sour Service)
2" DR200 Plug Valve with Fig 2002 Sub Ends
P/N P555080 (Standard Service)
P/N P537327 (Standard Service)
2'' DR200 Plug Valve with 2" Figure 2202 Integral Union Ends
P/N 3234183 (Sour Service)
3" DR50 Plug Valve with Figure 1502 Female End x Figure 1502 Male Sub End
P/N 3257091

Application/Limitation

Minimum Design Temperature	: -20°F (-29°C)
Maximum Design Temperature*	: 240°F (116°C)
Maximum Working Pressure	: 10,000 psi (Sour Service and Flanged Valves)
	: 15,000 psi (Sour Service DR200 Valve)
	: 15,000 psi (Standard Service)
	: 20,000 psi (Standard Service DR200 Valve)
Type of Service	: Sour and Standard Service
API 6A Product Specification Level	: 3

*Note: P/N P516108 is acceptable for use at 10,000 psi for Standard Service at 20°F to 350°F

Assemblies are not to be certified for use in the following systems unless the non-metallic seals are provided with qualification tests as provided below:

System	Required Non-Metallic Seal Testing
Mud & Cement system	API 6A, Annex F [1.11]
Injection	API 6A, Annex F [1.11]
MPD	API 6A, Annex F [1.11]
Choke and Kill	API 16C, Annex B [9]
Well Test, including Burner Boom	API 16C, Annex B [9]

Type Approval documentation

- 1 Inch Fig. 1502 Det Wing Union Calcs - PDD50004029
- 2 Inch Fig. 1502 Det Wing Union Calcs -PDD50004031
- 2 Inch Fig. 1502 Sour Gas Det Wing Union Calcs - PDD50003942
- 2 Inch Fig. 2002 Det Wing Union Calcs - PDD50004111
- 2 Inch Fig. 2202 Sour Gas Det Wing Union Calcs - PDD50003943
- 3 Inch Fig. 1502 Det Wing Union Calcs - PDD50003970

- Product Design Documentation, 1 Inch Ult150 Std Service Plug Valve Design Calcs - PDD50004733
- Product Design Documentation, 1 X 2 Inch Ult150 Standard Service Plug Valve CALCS - PDD50004683
- Product Design Documentation, 1 X 2 Inch Ult150 Standard Service Plug Valve W0.38 Bore Calcs- PDD50004685
- Product Design Documentation, 1x2 Inch Ult100 Sour Gas Service Plug Valve Design Calcs - PDD50004684
- Product Design Documentation, 2 Inch Dr150 Sour Gas Service Plug Valve Design Calcs - PDD50004687
- Product Design Documentation, 2 Inch Dr150 Std Service Plug Valve Design Calcs - PDD50004686
- Product Design Documentation, 2 Inch Dr200 Sour Gas Service Plug Valve Design Calculations - PDD50004721
- Product Design Documentation, 2 Inch Dr200 Std Service Plug Valve Design Calculations - PDD50004688
- Product Design Documentation, 3 Inch Dr50 Std Service Plug Valve Design Calcs - PDD50004690

Material Specifications:

Tests carried out

Test Procedures:

- Q50083 Rev A Plug Valve Test Procedure
- Q50193 Rev B Plug Valve Test Procedure with Hydrostatic Test Requirements per API 6A

Marking of product

For traceability to this Type Approval Certificate the prodcuts are as a minimum to be marked as follows:

- Serial Number
- Manufacturer's name and trademark
- To be reviewed and approved by DNV GL surveyor
- Additional marking at manufacturer's option

Other conditions/comments

1. If the minimum design temperature is less than 0°C, charpy impact testing is to be conducted at or below design temperature with acceptance criteria of 20 ft·lbs avg / 13.3 ft·lbs minimum.
2. If the equipment is to be used in sour environment, hardness testing in all components with wetted surfaces is required to comply with NACE MR0175.
3. All NDE operators are to be qualified to Level II or better per SNT-TC-1A.
4. The client may specifiy inspection and/or documentation requirements in addition to the approval conditions of this certificate in specific well control applications. In such cases, those requirements are to be satisfied by the documentation which would accompany the product or delivery.
5. The elastomeric seal material shall withstand both the working medium and the maximum/minimum working temperature.
6. Hydrostatic testing to be conducted at 1.5 times maximum working pressure; this holding time shall be sufficiently long to allow for leak detection after the pressure has stabilized.
7. Wellhead/Christmas tree and Choke and Kill applications shall be pressure tested in accordance with the current edition of API 6A and API 16C respectively.
8. Reference DNV GL projects A0599225 & A0599224

Periodical assessment

For certificate retention, a retention survey shall be performed after two and three-and-a-half years, in accordance with DNV GL's Type Approval Scheme, DNVGL-CP-0338.

END OF CERTIFICATE