



Certificate no.:
TAD00001MB

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Valve

with type designation(s)

Kelly Valves, see page 2 for model numbers.

issued to

ITAG Valves Engineering GmbH
Celle, Niedersachsen, Germany

is found to comply with

DNV-OS-E101 – Drilling facilities, Edition July 2021

DNV statutory interpretations DNV-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2021

Application:

See next page.

Issued at **Høvik** on **2024-03-04**

This Certificate is valid until **2029-03-03**.

for **DNV**

DNV local unit: **Hamburg Verification**

Approval Engineer: **Axel Janson**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2023-09

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Coded and Standards used as reference

[1] API Specification 7-1, Second Edition, February 2023

[2] API RP 7G, 16th Edition, May 2000

[3] ASME BPVC VIII Div.2, 2017 Edition

Product description

Kelly Valve Models:

BTG 8 1/2" x 3 1/16" - 6 5/8" FH 15,000 psi, Service Class 2

BTG 8" x 3.1/16" - 6.5/8Reg - 15,000psi, Service Class 2

BTG 8.5/8" x 3.1/16" - 7.5/8 REG - 15,000psi, Service Class 2

BTG 8" x 3.1/16" - 6.5/8 REG - 15,000psi, Service Class 2

BTG 8.1/2" x 3.1/2" - 7.5/8 REG - 15,000psi, Service Class 2

BTG 9" x 3.1/16" - NC61 - 15,000psi, Service Class 2

BTG 9" x 3.1/4" - NC61 - 10,000psi, Service Class 2

BTG 10" x 3.1/4" - 7.5/8 REG - 15,000psi, Service Class 2

BTG 10" x 4.1/4" - 8.5/8 REG - 15,000psi, Service Class 2

BTG-DC 10" x 4.1/4" - 8.5/8 REG - 15,000psi, Service Class 2

BTG 8.1/2"x3.1/16"-7.5/8" REG 10,000 psi, Service Class 2

BTG 12" x 4" - NC77 - 20,000 PSI, Service Class 2

BTG 8 5/8" x 3 1/16" - 7 5/8 Reg - API 15,000 PSI, Service Class 2

BTG 8 5/8" x 3 1/16" - 7 5/8 Reg - API 15,000 PSI, Service Class 2

BTG 10" x 4 1/4" - Flange - 10,000 PSI, Service Class 2

BTG-QC 9 1/2" x 3 3/4" - NC70 - 15,000 PSI, Service Class 2

Service Class 2:

Body and any stem seal shall hold internal pressure equal to the shell test pressure. Stem seal shall hold external pressure at a low pressure of 1.7 MPa (250 psi) and at a minimum high pressure of 13.8 MPa (2,000 psi). Closure seal shall hold pressure from below at a low pressure of 1.7 MPa and at a high pressure equal to the maximum rated working pressure. Closure seal shall hold pressure from above at a low pressure of 1.7 MPa and at a high pressure equal to the maximum rated working pressure.

Application/Limitation

All Kelly valves listed are intended for non-sour surface and downhole conditions.

BTG 8 1/2" x 3 1/16" - 6 5/8" FH 15000 psi, Service Class 2

- Working pressure:	1035 bar / 15,000 psi
- Test pressure:	1553 bar / 22,500 psi
- Max. external pressure:	2,000 psi (138 bar)
- Make-up torque:	106,226 Nm / 78,348 ft lbs
- Torque to yield:	177,043 Nm / 130,580 ft lbs
- Torque to yield (S=1.3):	136,187 Nm / 100,446 ft lbs
- Threads: Tension to yield:	11,047 kN / 2,482,605 lbs

- Body: Tension to yield: 8,000 kN / 1,798,472 lbs
- Body: Tension to yield (S=1.3): 6,154 kN / 1,383,439 lbs
- Operation torque: 910 Nm / 671 ft lbs
- Corrosion/Erosion allowance: 1 mm
- Gas tight
- Thread 6 5/8" FH
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 8" x 3.1/16" – 6.5/8Reg – 15,000psi, Service Class 2

- Working pressure: 103.5 N/mm² / 15,000 psi
- Test pressure: 155.1 N/mm² / 22,500 psi
- Make-up torque: 98,696 Nm / 72,768 ft lbs
- Torque to yield^{1a}: 152,045 Nm / 112,103 ft lbs
- Tension to yield²: 6,490 kN / 1,459,010 lbs
- Operational torque including S=1.3⁴: 116,958 Nm / 86,264 ft lbs
- Operational tension including S=1.3⁵: 4,992 kN / 1,122,315 lbs
- Operation torque³: 910 Nm / 672 ft lbs
- Corrosion Erosion allowance: 1 mm
- Gas tight
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 8.5/8" x 3.1/16" – 7.5/8Reg – 15,000psi, Service Class 2

- Working pressure: 103.5 N/mm² / 15,000 psi
- Test pressure: 155.1 N/mm² / 22,500 psi
- Make-up torque: 120,650 Nm / 88,987 ft lbs
- Torque to yield^{1b}: 201,084 Nm / 148,312 ft lbs
- Tension to yield²: 7,235 kN / 1,626,492 lbs
- Operational torque including S=1.3⁴: 154,680 Nm / 114,086 ft lbs
- Operational tension including S=1.3⁵: 5,565 kN / 1,251,148 lbs
- Operation torque³: 910 Nm / 672 ft lbs
- Corrosion Erosion allowance: 1 mm
- Gas tight
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

- 1) a) pin limited; b) box limited
- 2) body limited; including 15,000 psi pressure; excluding torque
- 3) maximum allowable crank torque
- 4) load limits considering a safety of S=1.3 to yield
- 5) load limits considering a safety of S=1.3 to yield, including 15, 000 psi pressure; excluding torque

Note:

Refer to ITAG Stress Calculations for each valve and the individual valve pressure test certificate for a complete load chart representation of the loading combinations.

BTG 8" x 3.1/16" – 6.5/8 REG – 15,000psi, Service Class 2

- Working pressure: 103.5 N/mm² / 15,000 psi
- Test pressure: 155.1 N/mm² / 22,500 psi
- Make-up torque: 79,148 Nm / 58,377 ft lbs
- Torque to yield^{1a}: 121,930 Nm / 89,899 ft lbs
- Tension to yield²: 4,775 kN / 1,073,463 lbs
- Operational torque including S=1.3: 93,792 Nm / 69,177 ft lbs
- Operational tension including S=1.3: 3,070 kN / 690,164 lbs
- Operation torque^{3b}: 910 Nm / 672 ft lbs

- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 8.1/2" x 3.1/2" – 7.5/8 REG – 15,000psi, Service Class 2

- Working pressure: 103.5 N/mm² / 15,000 psi
- Test pressure: 155.1 N/mm² / 22,500 psi
- Make-up torque: 94,650 Nm / 69,786 ft lbs
- Torque to yield^{1b}: 157,751 Nm / 116,309 ft lbs
- Tension to yield²: 5,437 kN / 1,222,286 lbs
- Operational torque including S=1.3: 121,347 Nm / 89,501 ft lbs
- Operational tension including S=1.3: 3,877 kN / 871,584 lbs
- Operation torque^{3b}: 1350 Nm / 996 ft lbs
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 9" x 3.1/16" – NC61 – 15,000psi, Service Class 2

- Working pressure: 103.5 N/mm² / 15,000 psi
- Test pressure: 155.1 N/mm² / 22,500 psi
- Make-up torque: 86,391 Nm / 63,696 ft lbs
- Torque to yield^{1b}: 143,984 Nm / 106,197 ft lbs
- Tension to yield²: 6,550 kN / 1,472,499 lbs
- Operational torque including S=1.3: 110,757 Nm / 81,690 ft lbs
- Operational tension including S=1.3: 4,700 kN / 1,056,602 lbs
- Operation torque^{3a}: 910 Nm / 672 ft lbs
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 9" x 3.1/4" – NC61 – 10,000psi, Service Class 2

- Working pressure: 69 N/mm² / 10,000 psi
- Test pressure: 103.5 N/mm² / 15,000 psi
- Make-up torque: 86,391 Nm / 63,696 ft lbs
- Torque to yield^{1b}: 143,984 Nm / 106,197 ft lbs
- Tension to yield²: 7,020 kN / 1,618,624 lbs
- Operational torque including S=1.3: 110,757 Nm / 81,690 ft lbs
- Operational tension including S=1.3: 5,186 kN / 1,165,859 lbs
- Operation torque^{3b}: 830 Nm / 612 ft lbs
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 10" x 3.1/4" – 7.5/8 REG – 15,000psi, Service Class 2

- Working pressure: 103.5 N/mm² / 15,000 psi
- Test pressure: 155.1 N/mm² / 22,500 psi
- Make-up torque: 111,192 Nm / 82,000 ft lbs
- Torque to yield^{1a}: 226,811 Nm / 167,227 ft lbs
- Tension to yield²: 9,800 kN / 2,203,128 lbs
- Operational torque including S=1.3: 174,470 Nm / 128,682 ft lbs
- Operational tension including S=1.3: 7,300 kN / 1,641,106 lbs
- Operation torque^{3a}: 950 Nm / 700 ft lbs
- Min. Design Temperature, body: -20°C
- Min. Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C

BTG 10" x 4.1/4" – 8.5/8 REG – 15,000psi, Service Class 2

– Working pressure:	103.5 N/mm ² / 15,000 psi
– Test pressure:	155.1 N/mm ² / 22,500 psi
– Make-up torque:	171,345 Nm / 126,378 ft lbs
– Torque to yield ^{1b} :	285,575 Nm / 210,629 ft lbs
– Tension to yield ² :	7,740 kN / 1,740,021 lbs
– Operational torque including S=1.3:	219,673 Nm / 162,023 ft lbs
– Operational tension including S=1.3:	5,550 kN / 1,247,690 lbs
– Operation torque ^{3a} :	1700 Nm / 1254 ft lbs
– Min. Design Temperature, body:	-20°C
– Min. Design Temperature, seals:	-10°C
– Max. Design Temperature:	+90°C

BTG-DC 10" x 4.1/4" – 8.5/8 REG – 15,000psi, Service Class 2

– Working pressure:	103.5 N/mm ² / 15,000 psi
– Test pressure:	155.1 N/mm ² / 22,500 psi
– Make-up torque:	171,345 Nm / 126,378 ft lbs
– Torque to yield ^{1b} :	285,575 Nm / 210,629 ft lbs
– Tension to yield ² :	7,694 kN / 1,729,680 lbs
– Operational torque including S=1.3:	219,673 Nm / 162,023 ft lbs
– Operational tension including S=1.3:	5,550 kN / 1,247,690 lbs
– Operation torque ^{3a} :	1700 Nm / 1254 ft lbs
– Min. Design Temperature, body:	-20°C
– Min. Design Temperature, seals:	-10°C
– Max. Design Temperature:	+90°C

BTG 8.1/2"x3.1/16"-7.5/8" REG 10000 psi, Service Class 2

– Working pressure:	68.95 N/mm ² / 10,000 psi
– Test pressure:	103.5 N/mm ² / 15,000 psi
– Make-up torque:	94,650 Nm / 69,810 ft lbs
– Torque to yield ^{1b} :	157,751 Nm / 116,351 ft lbs
– Tension to yield ² :	7,900 kN / 1,775,991 lbs
– Operational torque including S=1.3:	121,347 Nm / 164,400 ft lbs
– Operational tension including S=1.3:	6,077 kN / 1,366,146 lbs
– Operation torque ^{3a} :	910 Nm / 671 ft lbs
– Corrosion allowance:	1 mm
– Min. Design Temperature, body:	-20 °C
– Min. Design Temperature, seals:	-10 °C
– Max. Design Temperature:	+90 °C

1) a: pin limited, b: box limited

2) body limited; including working pressure; excluding torque

3) a: recommended for operation at pressure difference of 2,000psi, b: maximum allowable crank torque

Note:

Refer to ITAG Stress Calculations for each valve and the individual valve pressure test certificate for a complete load chart representation of the loading combinations.

BTG 12" x 4" – NC77 – 20,000 PSI, Service Class 2

– Min. Design Temperature, body:	-20 oC
– Min. Design Temperature, seals:	-10 oC
– Max. Design Temperature:	+90 oC
– Working pressure:	137.9 N/mm ² / 20,000 psi
– Test pressure:	207.0 N/mm ² / 30,000 psi
– Make-up torque:	181,000 Nm / 133,500 ft lbs
– Torque to yield ¹ :	363,299 Nm / 267,956 ft lbs
– Tension to yield ² :	13,618 kN / 3,061,448 lbs
– Torque to yield ⁴ : (S=1.3):	279,461 Nm / 206,120 ft lbs
– Tension to yield ⁵ : (S=1.3):	10,475 kN / 2,354,960 lbs
– Operation torque ³ :	2,000 Nm / 1475 ft lbs
– Corrosion / Erosion allowance:	1 mm

- 1 pin limited
- 2 body limited; including 20,000 psi pressure; excluding torque.
- 3 maximum allowable crank torque
- 4 load limits considering a safety of S=1.3 to yield
- 5 load limits considering a safety of S=1.3 to yield, including 20,000 psi pressure; excluding torque

BTG 8 5/8" x 3 1/16" - 7 5/8 Reg – API 15,000 PSI, Service Class 2

- Min. Design Temperature, body: -20 °C
- Min. Design Temperature, seals: -10 °C
- Max. Design Temperature: +90 °C
- Working Pressure: 15,000 Psi / 103.4 MPa
- Test Pressure: 22,500 Psi / 155.1 MPa
- Make-up Torque: 95,408 ft.lbs / 129,402 Nm
- Torque to Yield¹: 159,013 ft.lbs / 215,670 Nm
- Tension to Yield²: 2012,040 lbs / 8,950 KN
- Torque to Yield⁴ (S=1.3): 122,318 ft.lbs / 165,900 Nm
- Tension to Yield⁵ (S=1.3): 1547,723 lbs / 6,885 KN
- Operation Torque³: 672 ft.lbs / 910 Nm
- Corrosion / Erosion allowance: 1 mm

- 1 Box limited
- 2 Body limited; including 15,000 Psi pressure; excluding torque
- 3 Max allowable crank torque
- 4 load limits considering a safety of S=1.3 to yield
- 5 Load limits considering a safety of S=1.3 to yield, including 15,000 Psi; excluding Torque

BTG 8 5/8" x 3 1/16" - 7 5/8 Reg – API 15,000 PSI, Service Class 2

- Min. Design Temperature, body: -20 °C
- Min. Design Temperature, seals: -10 °C
- Max. Design Temperature: +90 °C
- Working Pressure: 15,000 Psi / 103.4 MPa
- Test Pressure: 22,500 Psi / 155.1 MPa
- Make-up Torque: 86,498 ft.lbs / 117,275 Nm
- Torque to Yield¹: 144,162 ft.lbs / 195,458 Nm
- Tension to Yield²: 1713,044 lbs / 7,620 KN
- Torque to Yield⁴ (S=1.3): 110,894 ft.lbs / 150,352 Nm
- Tension to Yield⁵ (S=1.3): 1317,726 lbs / 5,862 KN
- Operation Torque³: 672 ft.lbs / 910 Nm
- Corrosion / Erosion allowance: 1 mm

- 1 Box limited
- 2 Body limited; including 15,000 Psi pressure; excluding torque.
- 3 Max allowable crank torque
- 4 load limits considering a safety of S=1.3 to yield
- 5 Load limits considering a safety of S=1.3 to yield, including 15,000 Psi; excluding Torque

BTG 10" x 4 1/4" - Flange – 10,000 PSI, Service Class 2

- Working Pressure: 10,000 Psi / 69 MPa
- Test Pressure: 15,000 Psi / 103.5 MPa
- Min Design Temperature, body: -20°C
- Min Design Temperature, seals: -10°C
- Max. Design Temperature: +90°C
- Make-up Torque: 86,498 ft.lbs / 117,275 Nm
- Torque to Yield²: - ft.lbs / - Nm
- Tension to Yield³: - lbs / - KN
- Operation Torque¹: 1,475 ft.lbs / 2,000 Nm
- Corrosion / Erosion allowance: 1 mm

- 1 Max allowable crank torque

- 2 The Kelly valve does not transmit any torque.
3 The Kelly valve does not transmit any tensile load.

BTG-QC 9 1/2" x 3 3/4" - NC70 – 15,000 PSI, Service Class 2

- Working Pressure:	15,000 Psi / 103.4 MPa
- Test Pressure:	22,500 Psi / 155.1 MPa
- Min. Design Temperature, body:	-20°C
- Min. Design Temperature, seals:	-10°C
- Max. Design Temperature:	+90°C
- Thread Connections:	NC70
- Make-up Torque:	118,255 ft.lbs / 160,390 Nm
- Torque to Yield ¹ :	197,163 ft.lbs / 267,317 Nm
- Tension to Yield ² :	1759,130 lbs / 7,825 KN
- Torque to Yield ⁴ (S=1.3):	151,664 ft.lbs / 205,628 Nm
- Tension to Yield ⁵ (S=1.3):	1353,177 lbs / 6,019 KN
- Operation Torque ³ :	1,475 ft.lbs / 2,000 Nm
- Corrosion / Erosion allowance:	1 mm

1 Box limited

2 Body limited; including 15,000 Psi pressure; excluding torque.

3 Max allowable crank torque

4 load limits considering a safety of S=1.3 to yield

5 Load limits considering a safety of S=1.3 to yield, including 15,000 Psi; excluding Torque

Type Approval documentation

BTG 8 1/2" x 3 1/16" - 6 5/8" FH 15000 psi, Service Class 2:

BTG 8" x 3.1/16" – 6.5/8Reg – 15.000psi, Class 2:
BTG 8.5/8" x 3.1/16" – 7.5/8 REG – 15.000psi, Class 2:
BTG 8" x 3.1/16" – 6.5/8 REG – 15.000psi, Class 2:
BTG 8.1/2" x 3.1/2" – 7.5/8 REG – 15.000psi, Class 2:
BTG 9" x 3.1/16" – NC61 – 15.000psi, Class 2:
BTG 9" x 3.1/4" – NC61 – 10.000psi, Class 2:
BTG 10" x 3.1/4" – 7.5/8 REG – 15.000psi, Class 2:
BTG 10" x 4.1/4" – 8.5/8 REG – 15.000psi, Class 2:
BTG-DC 10" x 4.1/4" – 8.5/8 REG – 15.000psi, Class 2:
BTG 8.1/2"x3.1/16"-7.5/8" REG 10000 psi, Class 2:

BTG 12" x 4" – NC77 – 20,000 PSI, Class 2:

BTG 8 5/8" x 3 1/16" - 7 5/8 Reg – API 15000 PSI, Class 2:

BTG 8 5/8" x 3 1/16" - 7 5/8 Reg – API 15000 PSI, Class 2:

BTG 10" x 4 1/4" - Flange – 10,000 PSI, Class 2:

BTG-QC 9 1/2" x 3 3/4" - NC70 – 15,000 PSI, Class 2:

Design Verification Test

Tests to be carried out on each individual product

Test Procedures:

1. Pressure testing shall be performed in accordance with DNV-OS-E101 Ch.2 Sec.8 §3.3, and API Spec 7-1 §5.3. Testing shall be witnessed by a DNV surveyor.
2. Functional testing shall be performed in accordance with DNV-OS-E101 Ch.2 Sec.8 §3.5. Testing shall be witnessed by a DNV surveyor.
3. Charpy Impact testing shall be conducted according to DNV-OS-E101 Ch.2 Sec.2.

NDE Procedures:

4. Non-destructive examination methods shall be in accordance with DNV-OS-E101 Ch.2 Sec.8.

Welding Procedures:

5. Qualification of welding procedures and qualification of welders shall be in accordance with DNV-OS-E101 Ch.2 Sec.8.

Marking of product

For traceability, marking of each product shall be carried out in accordance with API Spec 7-1 and contain:

- Part number
- Serial number
- Maximum Working Pressure
- Manufacturers name or mark
- Additional marking as relevant

Conditions and comments

- All materials for load-carrying parts are to be delivered with 3.1 certificates per ISO 10474 or equivalent.
- Fatigue has not been evaluated in this design approval. It is the responsibility of the end user to perform fatigue analysis, as applicable.
- The kelly valves shall be inspected according to manufacturer's specifications, including MPI, after each well operation, or every 5-7 months.
- This Type Approval Certificate replaces the previously issued Type Approval Certificate TAD00000ZS.

Periodical assessment

For retention of this Type Approval Certificate, product audits shall be performed every second year by a DNV surveyor. Reference is made to DNV-CP-0338.

END OF CERTIFICATE