Certificate no.:
TAD00001N7

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Valve

with type designation(s)
7152/7156/7162 Kelly Valves

issued to
Hi-Kalibre Equipment Ltd.
Edmonton, AB, **Canada**

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:

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

Issued at **Houston** on **2024-08-08**
This Certificate is valid until **2029-08-07**.
DNV local unit: **Vancouver**

for **DNV**

Approval Engineer: **Parna Deljo**

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.

Product description

Hi-Kalibre Equipment Drill Stem Safety Valves (DSSV) are used for both blow out prevention and mud control during drilling operations.

Reference Standard

- API Specification 7-1, *Specifications for Rotary Drill Stem Elements,* 2nd Edition.
- API Specification 7-2, *Threading and Gauging of Rotary Shouldered Thread Connection*, 2nd Edition.
- API RP 7G, *Recommended Practice for Drill Stem Design and Operating Limits*, 16th Edition.
- NACE MR-0175 – 2021 *Petroleum and natural gas industries - Materials for use in H2S-containing environments in oil and gas production*.

Application/Limitation

Design Parameter	Value	(Equivalent)
Minimum Design Temperature	: 14°F	(-10°C)
Sealings System Temperature Range	: 14°F to 194°F	(-10°C to 90°C)
Maximum Working Pressure	: 15,000 psi	(103.5 MPa)
Hydrostatic Test Pressure	: 22,500 psi	(155.1 MPa)
API 7-1 Service Class	: Class 2	
API 7-1 Supplement	: H2S Trim	
System	: Well Control System; BOP	
Equipment	: Valve in Drill String	
7152 Valve		
Maximum Tensile Capacity[1] @ 0 psi MWP	: 2,759,654 lbf	(12,275.5 kN)
Maximum Tensile Capacity[1]	: 2,270,013 lbf	(10,097.5 kN)
at Maximum Working Pressure and 198,179 ft-lbf maximum torsional load for connection		
Maximum Torsional Load for NC77 End connection	: 198,179 ft-lbf	(268,694.6 J)
7156 Valve		
Maximum Tensile Capacity[1] @ 0 psi MWP	: 2,500,000 lbf	(11,120.5 kN)
Maximum Tensile Capacity[1]	: 2,107,964 lbf	(9,376.7 kN)
at Maximum Working Pressure and 192,562 ft-lbf maximum torsional load for connection		
Maximum Torsional Load for NC77 End connection	: 192,562 ft-lbf	(261,079.0 kN)
7162 Valve		
Maximum Tensile Capacity[1] @ 0 psi MWP	: 3,250,167 lbf	(14,457.5 kN)
Maximum Tensile Capacity[1]	: 2,270,013 lbf	(10097.5 kN)
at Maximum Working Pressure and 198,179 ft-lbf maximum torsional load for connection		
Maximum Torsional Load for NC77 End connection	: 198,179 ft-lbf	(268,694.6 J)
Maximum Torsional Load for NC84 End connection	: See NC84 Specification[2]	

Note 1: All operating conditions for the product shall be within the limits specified in the Combined Loading Curves reported by the manufacturer in the design package listed under "Calculation." Capacities may be further limited by end connections.

Note 2: End connection are proprietary designs and have been excluded from this design assessment. The claimed rating of end connections has not been evaluated by DNV for conformance to any applicable codes.

Type Approval documentation

Tests carried out

Doc No.	Date	Title
PR.CO-ENG-052-APPX	10/25/23	CLASS II TEST APPENDIX
PR.CO-ENG- 052	10/25/23	CLASS II TEST REPORT– DESIGN VERIFICATION TESTING FOR EXTERNAL AND INTERNAL PRESSURE

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. Marking as specified in API 7-1.

Periodical assessment

Periodical assessments for type approvals will be required after two years (+/- 90 days) and after three-and-a-half years (+/- 90 days) in accordance with DNV-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's local surveyor.
2. When DNV Product Certification is required, each product is to be surveyed during fabrication in accordance with the requirements for Category I equipment as defined in DNV's Offshore Standard DNV-OS-E101.
3. DNV ref.: A1534855

END OF CERTIFICATE