



Certificate no.:  
**TAD00001N9**

# TYPE APPROVAL CERTIFICATE

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## This is to certify:

that the Valve

with type designation(s)  
**IB1225 Single IBOP**

issued to

**Packard International**  
**Conroe, TX, USA**

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 **2024-06-20**

This Certificate is valid until **2029-06-19**.

for **DNV**

DNV local unit: **Certification & Inspection Services**

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.



Form code: TA 251

Revision: 2023-09

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## Product description

The one IBOP is a check valve designed to be operated manually or automatically through the movement of the dart to allow/restrict the passage of mud through the valve.

## Reference Standard

- API 7-1, Rotary Drill Stem Elements, 2nd Edition.
- API 7-2, Threading and Gauging of Rotary Shouldered Connections, 2nd Edition
- NACE MR0175/ISO 15156, 'Petroleum and Natural Gas Industries – Material for Use in H<sub>2</sub>S – Containing Environments in Oil and Gas Production

## Application/Limitation

The following table indicates the design limits of the valve excluding the end connections. End connections have been excluded from this design assessment. The design limits of the valve including end connections are the lesser of the indicated design limits and the end connection design limits.

| Design Parameter                           | Value                                           | Equivalent      |
|--------------------------------------------|-------------------------------------------------|-----------------|
| Minimum Design Temperature                 | : -4°F                                          | (-20°C)         |
| Sealing 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 1                                       |                 |
| API 7-1 Supplement                         | : H <sub>2</sub> S TRIM                         |                 |
| Maximum Torsional Load for End Connections | : See End Connection Specification <sup>1</sup> |                 |
| System                                     | : BOP Systems                                   |                 |
| Equipment                                  | : BOP Equipment/ Valves in Drillstring          |                 |

### For OD 4-1/8"

|                                                                                                   |                 |              |
|---------------------------------------------------------------------------------------------------|-----------------|--------------|
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 940,832 lbs   | (4,185.0 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (120 ksi MYS) |                 |              |
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,060,054 lbs | (4,715.4 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (130 ksi MYS) |                 |              |
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,176,643 lbs | (5234.0 kN)  |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (140 ksi MYS) |                 |              |

### For OD 4-1/2"

|                                                                                                   |                 |             |
|---------------------------------------------------------------------------------------------------|-----------------|-------------|
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,266,869 lbs | (5635.3 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (120 ksi MYS) |                 |             |
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,408,792 lbs | (6266.6 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (130 ksi MYS) |                 |             |
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,547,967 lbs | (6885.7 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (140 ksi MYS) |                 |             |

### For OD 4-3/4"

|                                                                                                   |                 |             |
|---------------------------------------------------------------------------------------------------|-----------------|-------------|
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,489,413 lbs | (6625.2 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (120 ksi MYS) |                 |             |
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,648,783 lbs | (7334.1 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (130 ksi MYS) |                 |             |
| Maximum Tensile Capacity <sup>2</sup>                                                             | : 1,805,534 lbs | (8031.4 kN) |
| at Maximum Working Pressure and 30,000 ft-lbf maximum torsional load for connection (140 ksi MYS) |                 |             |

| Design Parameter                                                                                                                              | Value           | Equivalent   |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|
| <b>For OD 5"</b>                                                                                                                              |                 |              |
| Maximum Tensile Capacity <sup>2</sup><br>at Maximum Working Pressure and 30,000 ft-lbf<br>maximum torsional load for connection (120 ksi MYS) | : 1,719,295 lbs | (7647.8 kN)  |
| Maximum Tensile Capacity <sup>2</sup><br>at Maximum Working Pressure and 30,000 ft-lbf<br>maximum torsional load for connection (130 ksi MYS) | : 1,897,315 lbs | (8440.0 kN)  |
| Maximum Tensile Capacity <sup>2</sup><br>at Maximum Working Pressure and 30,000 ft-lbf<br>maximum torsional load for connection (140 ksi MYS) | : 2,073,044 lbs | (9221.4 kN)  |
| <b>For OD 5-1/4"</b>                                                                                                                          |                 |              |
| Maximum Tensile Capacity <sup>2</sup><br>at Maximum Working Pressure and 30,000 ft-lbf<br>maximum torsional load for connection (120 ksi MYS) | : 1,957,389 lbs | (8707.0 kN)  |
| Maximum Tensile Capacity <sup>2</sup><br>at Maximum Working Pressure and 30,000 ft-lbf<br>maximum torsional load for connection (130 ksi MYS) | : 2,155,457 lbs | (9587.9 kN)  |
| Maximum Tensile Capacity <sup>2</sup><br>at Maximum Working Pressure and 30,000 ft-lbf<br>maximum torsional load for connection (140 ksi MYS) | : 2,351,441 lbs | (10460.0 kN) |

*Note 1: End connections 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.*

*Note 2: 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.*

## Type Approval documentation

### Tests carried out

| <u>Doc No.</u> | <u>Date</u>    | <u>Title</u>                 |
|----------------|----------------|------------------------------|
| --             | April 08, 2022 | Hydrostatic Pressure Testing |

### 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.: A1519700

END OF CERTIFICATE