CERTIFICATE NUMBER	23-2487043-PDA
EFFECTIVE DATE	22-Dec-2023
EXPIRY DATE	21-Dec-2028
ABS TECHNICAL OFFICE	London Engineering Department

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

BONDURA TECHNOLOGY

located at

P.O. BOX 98, , N-4349 BRYNE, Norway

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product:	**Radial Expansion Pins**
Model:	**Bondura Pin System (See attachment for model types)**
Endorsements:	
Tier:	**5 - Unit Certification Required**

This Product Design Assessment (PDA) Certificate remains valid until 21/Dec/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

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Tier: 5 - Unit Certification Required

Product: **Radial Expansion Pins**
Model: **Bondura Pin System (See attachment for model types)**
Endorsements:

Intended Service:
Bondura Pin System for Hoisting and Pipe Handling Equipment for marine and offshore applications which include the following:
Top drive; motion compensation systems; drawworks; travelling equipment; iron roughnecks; cranes; jacking/skidding; winches and winch systems; manipulators; retractable dolly systems; lifting systems; dredging equipment; anchor handling equipment; rudder systems; hydraulic, pneumatic and electric cylinder systems.

Description:
The Bondura Pin System consists of a pivot pin, tapered at both ends and two to four cone sleeves. The cone sleeves with corresponding tapering are assembled and expand on the pin upon tightening.

Rating:
The Design Load capacity of individual Bondura Pin System has been rated based on a safety factor of 3 for both “bending and shear” and “shear only” loading cases respectively. This rated design capacity is to be used as a minimum for any of specified intended services. Acceleration or impact in loading will reduce the rated design capacity. Refer to the attachment herein for details of the pin’s rated design loads.

The mounting details of each pin have been specified, while for each installation, the pin’s bearing strength is subject to additional review.

Design and Minimum Operating Temperature: –20 °C (–4 °F) (as per API 8C)

Service Restriction:
Unit Certification is required for this product if the radial expansion pin is intended for Essential Services as per 4-1-1 Tables 2 of the ABS Marine Vessels Rules and 6-1-4 Table 1 and 6-1-9 Tables 2 of Mobile Offshore Units Rules. If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:
1. Required toughness (Charpy V-notch impact testing) of the Bondura pins is to be in accordance with Section 5 of the ABS Guide for the Classification of Drilling Systems (CDS) 2019, as applicable.
2. The previous 6.1 and 6.6 assembly and inspection manuals are no longer valid.
3. Inspection is to be performed by trained and competent personnel as Assembly & Inspection Manuals for 6.6-LC, Standard and Dual which is considered as representative for the main types of the pin system.
4. The manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:
Drawing No. Calculation-near and at supports, Calculation-near and at supports, Revision: -, Pages: -
Drawing No. Calculation-point loads at center area, Calculation-point loads at center area, Revision: -, Pages: -
Drawing No. GA-0300, bondura 3.1 dia 30-500, Revision: D, Pages: 1
Drawing No. GA-0310, bondura 3.3 dia 10- 500, Revision: D, Pages: 1
Drawing No. GA-0318, bondura 3.4 dia 10- Â500, Revision: C, Pages: 1
Drawing No. GA-0320, bondura 3.2 dia 25- 500, Revision: C, Pages: 1
Drawing No. GA-0322, bondura 4.4 dia 10- 500, Revision: C, Pages: 1
Drawing No. GA-0324, bondura 6.6 dia 25- 69, Revision: D, Pages: 1
Drawing No. GA-0326, bondura 6.6 dia 50- 500, Revision: D, Pages: 1
Drawing No. GA-0328, bondura 6.1 dia 20- 59, Revision: D, Pages: 1
Drawing No. GA-0330, bondura 6.1 dia 59- 99, Revision: D, Pages: 1
Drawing No. GA-0332, bondura 6.1 dia 59- 275, Revision: D, Pages: 1

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Tier: 5 - Unit Certification Required

Drawing No. GA-0338, bondura 6.2 dia 55- 500, Revision: D, Pages: 1
Drawing No. GA-0339, bondura 6.2 dia 25- 69, Revision: D, Pages: 1
Drawing No. GA-0345, bondura dual 66 dia 30- 500, Revision: C, Pages: 1
Drawing No. GA-0350, bondura 6.6 dia 20- 140, Revision: C, Pages: 1
Drawing No. GA-0360, bondura 6.6 LC dia 40- 500, Revision: B, Pages: 1
Drawing No. GA-0362, bondura 3.3 LC dia 50- 500, Revision: B, Pages: 1
Drawing No. GA-0364, bondura 6.2 LC dia 55- 500, Revision: A, Pages: 1
Drawing No. GA-0370, bondura dual 36 dia 25- 500, Revision: C, Pages: 1
Drawing No. GA-4517, bondura 6.1 dia 140- 500, Revision: B, Pages: 1
Drawing No. Interface bondura PIN, Interface bondura PIN, Revision: -, Pages: -
Drawing No. 109350, Assembly & Inspection Manual 6.6-LC, Revision: A, Pages: 8
Drawing No. 110086, Assembly & Inspection Manual Standard, Revision: A, Pages: 4
Drawing No. 110137, Assembly & Inspection Manual Dual, Revision: A, Pages: 4

Terms of Validity:
This Product Design Assessment (PDA) Certificate remains valid until 21/Dec/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

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STANDARDS

ABS Rules:
2023 Rules for Conditions of Classification 1-1-4/7.7, 1-1-A3, 1-1-A4, which cover the following:
2023 Rules for Building and Classing Marine Vessels: 4-3-2/5.13 and 4-3-2/5.15
2023 Rules for Conditions of Classification Facilities on Offshore Installations 1-1-4/9.7, 1-1-A2, 1-1-A3
2023 Rules for Building and Classing – Mobile Offshore Units 6-1-4, 6-1-9
2019 Classification of Drilling Systems 2-6/9, Section 5 & Section 6
2021 Guide for Certification of Lifting Appliances, 2-2/Table 1, 2-3/5 and 4-2/5.5

National:
FEM 1.001 Rules for the Design of Hoisting Appliances, 3rd Ed, 1998;
Eurocode 3: Steel Structures Part 1-1 Design Rules 1993-1-1:2005.

International:
Specification for Drilling and Production Hoisting Equipment (PSL 1 and PSL 2) API Specification 8C Fifth Edition, October 2012 ANSI/API 8C

Government:
NA

EUMED:
NA

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Tier: 5 - Unit Certification Required

OTHERS:
NA