



Indian Register of Shipping

CERTIFICATE NO.: 2026TAC122

TYPE APPROVAL CERTIFICATE

*This is to certify that the product is in accordance with the applicable rules/standards/codes as described below. The product is considered to be suitable for use in marine applications and is **included** in the list of approved products.*

MANUFACTURER	Duramax Marine LLC
REGISTERED OFFICE & WORKS	Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH, USA
PRODUCT NAME	SYNTHETIC BEARING
MODEL NO. / TRADE NAME	DMX® Locking Stave System
PRODUCT DESCRIPTION	DMX® Locking Stave System Water Lubricated Stern Tube Bearings/Strut Bearings See ANNEXURE I for more details
APPLICABLE RULES/STANDARDS/CODES	[1] Part 4, Chapter 4 of IRS Rules and Regulations for the Construction and Classification of Steel Ships. [2] IRS Classification Notes: Type Approval Testing of Synthetic Materials for Aftmost Propeller Shaft Bearings
CONDITIONS OF APPROVAL	See ANNEXURE I
VALIDITY	The Certificate is valid until 25/10/2031



ISSUE DATE : 26/10/2026

PLACE : MUMBAI

The validity of this certificate is subject to Annual audit being carried out and the annexure to this certificate being endorsed by the Society's Surveyors.



For Indian Register of Shipping
Electronically Signed By: T. Ghosh
Location: MUMBAI
Signing Date: 26/10/2026 (dd/mm/yyyy)

T. Ghosh

Sr. Principal Surveyor

This Certificate is issued upon the following terms and conditions as laid down in the Society's Regulations:-

Whilst Indian Register of Shipping, a Classification Society, along with its subsidiaries and associates (hereinafter referred to as the Society) and its Board/Committees use their best endeavors to ensure that the functions of the Society are properly carried out, in providing services, information or advice neither the Society nor any of its servants or agents warrants the accuracy of any information or advice supplied. Except as set out herein neither the Society nor any of its servants or agents (on behalf of each of whom the Society has agreed this clause) shall be liable for any loss damage or expense whatever sustained by any person due to any act or omission or error of whatsoever nature and however caused of the Society, its servants or agents or due to any inaccuracy of whatsoever nature and howsoever caused in any information or advice given in any way whatsoever by or on behalf of the Society, even if held to amount to a breach of warranty. Nevertheless, if any person uses services of the Society, or relies on any information or advice given by or on behalf of the Society and suffers loss damage or expenses thereby which is proved to have been due to any negligent act omission or error of the Society, its servants or agents or any negligent inaccuracy in information or advice given by or on behalf of the Society then the Society will pay compensation to such person for his proved loss up to but not exceeding the amount of the fee charged by the Society for that particular service, information or advice. Any notice of claim for loss, damage or expense, as referred to above, shall be made in writing to the Society's Head Office within six months of the date when the service, information or advice was first provided, failing which all the rights to any such claim shall be forfeited and the Society shall be relieved and discharged from all liabilities.

Form No.: TA_CL_R.6

The signatures in this document are electronic in accordance with FAL.5/

Circ. 39 Rev 2 and additional handwritten signature are not required.



TID: IRS/2026/2026TAC122/00309

ANNEXURE - I
(TO CERTIFICATE NO. 2026TAC122 DATED 26 OCTOBER 2026)

PRODUCT DESCRIPTION

Synthetic Bearing - DMX® Locking Stave System

Application: Stern Tube Bearings/Strut Bearings

Bearing System Components: (1) Rubber Locking Staves, (2) DMX Staves: A Proprietary Polymer Alloy and
(3) Rubber locking Staves with keeper bar slot.

Material Type: Isotropic and Elastomeric

Shaft Diameter Range: 75 mm ~ 1000 mm

Lubrication Type: Fresh Water and Sea Water

Permissible Surface Pressure: 0.55 MPa

Maximum Operating Temperature: 79.4°C



APPROVED DRAWINGS AND TEST REPORTS

- Drawings listed in Design Approval Document No. E-295017-395421 dated 21 April 2026.
- Test Report no. 184534 -A Rev. 1 dated 6 Aug 2026 and 185916 dated 1 Sept 2026, issued by AKRON RUBBER DEVELOPMENT LABORATORY, INC.
- Report JK106-R3437: Duramax Marine SPA on Gunmetal Shaft - 2000 hrs trial, from BMT Defense Services LTD.

CONDITIONS OF APPROVAL

1. The scope of type approval certificate covers approval of plans and type testing of a representative sample in accordance with Pt. 4, Ch. 4, Section 6 of Rules & Regulations of Indian Register of Shipping.
 2. This synthetic bearing has to satisfy the mandatory & general requirements detailed in IRS Design Approval Document E-295017-395421 dated 21 April 2026.
 3. The length of the synthetic bearing shall be such that, the nominal bearing pressure will not exceed 0.55 [N/mm²].
 4. In no case, the length of the bearing, next to and supporting the propeller shall be less than 2.0 times the rule diameter of the Tail shaft.
 5. All bearings require water flow. Forced water lubrication is to be provided for all bearings, where the shaft diameter is 380 [mm] or over. The supply water may come from a circulating pump or other pressure source. The water grooves in the bearings are to be of ample section and of a shape which will be little affected by wear-down.
 6. For each installation onboard IRS Classed Vessel, the relevant constructional drawings are to be submitted for Ship specific approval.
 7. The installation on board is to be made in accordance with the manufacturer's instructions.
 8. The Bearing unit(s) intended for installation on-board Indian Naval ships shall comply with the project specific requirements additionally.
 9. Any changes to the approved design parameters or construction are to be intimated and approved by IRS.
 10. Unit certification is required prior to installation on board the vessel.
-



TID: IRS/2026/2026TAC122/00309

ANNEXURE – II

Annual/ Intermediate Surveillance Audit Due On : 26 April, 2029

Signature _____
Surveyor's Name _____
Outport _____
Date _____

IRS Stamp

