



Marine & Offshore
Division

Certificate number: 23091/B1 BV

File number: MAT 73871-2010

Product code: 8155I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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APPROVAL CERTIFICATE for MATERIALS

This certificate is issued to

Morris Bean & Company
Yellow Springs - UNITED STATES OF AMERICA

for the type of product

ALUMINIUM ALLOY CASTINGS

Casting up to 7,000 lbs (3,150kg) in magnesium-silicon aluminium alloy type AlSi7Mg

Requirements:

Bureau Veritas Rules on Materials and Welding for the Classification of Marine Units

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 29 Jun 2020

For BUREAU VERITAS,

At BV PORT EVERGLADES CENTRE, on 24 Oct 2016,

Flavio Rosas



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

Castings made of magnesium-silicon aluminium alloy type AlSi7Mg for cryogenic application.

Typical grade	Delivery condition	Particulars
A356.0 - T6	T6 : Solution treated and artificially aged	Max. weight 7,000 lbs (3,150kg)

Alloy making in PLC controlled low-pressure furnace. Castings are heat treated by solution heat treatment followed by artificial ageing.

2. DOCUMENTS AND DRAWINGS :

Casting grade A356.0-T6 according to ASTM B26 standard. Chemical composition on ladle and mechanical properties as per applicable standard for approved application.

As per following document issued by Morris Bean & Company:

- Morris Beam company presentation, calibration reports, production flow chart and organisation chart, submitted in 2010.
- "Quality Manual Rev.9" dated 15 March 2015,
- "ASTM-B-917 Implementation at MBC Rev.2" dated 28 July 2009,
- "Separately Cast Test Bar Rev.1" dated 30 April 2008,
- "Quenching procedures Rev.3" dated 09 July 2014,
- "Heat Treat Procedures Rev.5" dated 06 November 2015,
- "Heat Treat Uniformity Survey Rev.2" dated 13 November 2015,
- "Radiographic Inspection Rev.6" dated 12 December 2012.

3. TEST REPORTS :

- "Nikkiso Material Affidavit #3902 and #3859" issued by Morris Bean & Company and dated 11/02/2010.

4. APPLICATION / LIMITATION :

As per Bureau Veritas Rules for Classification. Chemical composition and tensile properties requirements are to be as per Bureau Veritas Rules NR216 and/or alternative specification mentioned on reviewed drawings, as applicable.

5. PRODUCTION SURVEY REQUIREMENTS :

The aluminium alloy castings are to be supplied by Morris Bean & Company in compliance with the type and the requirements described in this certificate.

This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

BV product certificate is required.

6. MARKING OF PRODUCT :

As per Bureau Veritas Rules for Classification.

7. OTHERS :

This certificate replaces approvals No.23091/A0 BV and No.23091/B0 BV.

*** END OF CERTIFICATE ***