



Marine & Offshore

Certificate number: 14713/D0 BV

File number: MAT 1176

Product code: 8153I

*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*

**DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.**  
CHANGWON - KOREA (REPUBLIC OF)

*for the type of product*

**STEEL FORGINGS**

Forgings for crankshafts in carbon steels and alloy steels of maximum weight 270 tons

**Requirements:**

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

*This certificate is issued to attest that Bureau Veritas Marine & Offshore 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 Dec 2025**

**For Bureau Veritas Marine & Offshore,**

At BV PUSAN, on 29 Dec 2020,

Chang-Uk HONG



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 Marine & Offshore. 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 available on the internet site [www.veristar.com](http://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 Marine & Offshore 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 :**

Steel forgings for crankshafts in carbon steels and alloy steels of maximum weight 270 tons.

Steelmaking by Electric Arc Furnace, Ingot casting.  
Forgings delivered in normalised and tempered condition.

Typical grades are 34CrNiMo6, M60.6 KW, S34MnV as per engine maker's specifications.

### **2. DOCUMENTS AND DRAWINGS :**

2.1 As per following documents issued by Doosan Heavy Industries & Construction Co., Ltd.

- "Documents for type approval" dated 16 November 2004.
- "Procedure FNG-0012 Rev.0" dated 15 May 2001.

2.2 As per following documents issued by Man Energy Solutions:

- "Quality specification N° 0743099-1.3" dated December 2018.

### **3. TEST REPORTS :**

As per following documents issued by Doosan Heavy Industries & Construction Co., Ltd.

- Certificates of inspection No.0738PSN02 dated 26 October 2002 and No.2919PSN03 dated 20 March 2004.
- "H1487 Crancksaft - Quality documentation file" dated 21 February 2020.

### **4. APPLICATION / LIMITATION :**

As per Bureau Veritas Rules for Classification.

Chemical composition, tensile properties and Charpy-V notch test requirements are to be as per Bureau Veritas rules NR216 and/or alternative specification mentioned on reviewed drawings, as applicable.

### **5. PRODUCTION SURVEY REQUIREMENTS :**

5.1 - The steel forgings are to be supplied by Doosan Heavy Industries & Construction Co., Ltd in compliance with the type and the requirements described in this certificate.

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

5.3 - BV product certificate is required.

### **6. MARKING OF PRODUCT :**

As per Bureau Veritas Rules for Classification.

### **7. OTHERS :**

This certificate replaces approvals from No.14713/A0 BV to No.14713/C0 BV.

\*\*\* END OF CERTIFICATE \*\*\*