

No. : 15EW5433ROL

Date: 8 May 2015

Dongkuk Steel Mill Co., Ltd. Dangjin Works

25, Godaegongdan 1-gil, Songak-eup, Dangjin-Si,
Chungcheongnam-do, Korea

Approval of Manufacturing Process of Rolled Steels

Dear Sirs,

This is to inform that we have approved the captioned manufacturing process.

Enclosed please find the certificate of approval and invoice together with relevant document.

Apart from the above, your company is kindly requested to return the previous certificate (Certificate No. TA14573E) to NK Seoul office.

We appreciate the opportunity to work with your company.

Yours faithfully,



T. Imamura

General Manager

Material and Equipment Department

Encl.:

- (1) Certificate of approval (TA15391E)
- (2) Particulars of approval (TA15392E)
- (3) Invoice

Cc: NK Seoul Office

NK Busan Office



Approval No. ST105RO
Certificate No. TA15391E

APPROVAL OF MANUFACTURING PROCESS

This is to certify that

**Dongkuk Steel Mill Co., Ltd. Dangjin Works
Dangjin, Chungcheongnam
Korea**

has been approved for the manufacturing process of undermentioned materials by the NIPPON KAIJI KYOKAI in accordance with the requirements of 1.2, Part K of the Society's "Rules for the Survey and Construction of Steel Ships" and Chapter 1, Part 1 of the Society's "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use".

***MATERIALS* : Rolled Steels for Hull**

The details of the relevant approval conditions are given in the PARTICULARS OF APPROVAL listed in the reverse of this certificate.

The products for the ships classed with the Society are to be manufactured, tested and inspected in compliance with the Rules.

This Certificate is valid until 4 March 2020.
Issued at Tokyo on 8 May 2015.

Renewal Date : 5 March 2015


T. Imamura
General Manager
Material and Equipment Department



No. : TA15392E

Date : 8 May 2015

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of Rolled Steels for Hull

1. Manufacturer : Dongkuk Steel Mill Co., Ltd. Dangjin Works
2. Kind of Product : Steel Plates
3. Grade : KA, KB, KD, KE, KA32, KD32, KE32, KF32, KA36, KD36, KE36, KF36, KA40, KD40 and KE40
4. Deoxidation Practice : Fine-grained Killed
5. Grain Refining Elements : See Table.
6. Max. Thickness : See Table.
7. Condition of Supply : See Table.
8. Raw Materials : Steel slabs with the steel making process and casting process below, by JFE Steel Corporation, West Japan Works (Kurashiki) are to be used.
 - (1) Basic Oxygen Furnace
 - (2) Continuous Casting

(to be cont.)

Table: Part of Approval Conditions

Grade	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KA	Al	50	AR	-
		100	N	(1)
		50	CR	-
		83	TMCP(AcC)	(1)
KB	Al	50	AR	-
		100	N	(1)
		50	CR	-
		83	TMCP(AcC)	(1)
KD	Al	35	AR	-
		100	N	(1)
		50	CR	-
		83	TMCP(AcC)	(1)
KE	Al-Ti-Nb	83	N	(1)
			TMCP(AcC)	(1)
KA32	Al-Ti-Nb	12.5	AR	(1)
		70	N	(1)
		50	CR	(1)
		83	TMCP(AcC)	(1)
KD32	Al-Ti-Nb	12.5	AR	(1)
		70	N	(1)
		50	CR	(1)
		83	TMCP(AcC)	(1)
KE32	Al-Ti-Nb	70	N	(1)
			83	TMCP(AcC)
KF32	Al-Ti-Nb	50	TMCP(AcC)	(1)
KA36	Al-Ti-Nb	12.5	AR	(1)
		70	N	(1)
		50	CR	(1)
		83	TMCP(AcC)	(1)
KD36	Al-Ti-Nb	12.5	AR	(1)
		70	N	(1)
		50	CR	(1)
		83	TMCP(AcC)	(1)
KE36	Al-Ti-Nb	70	N	(1)
			83	TMCP(AcC)
KF36	Al-Ti-Nb	50	TMCP(AcC)	(1)
KA40	Al-Ti-Nb	83	TMCP(AcC)	(1)
KD40	Al-Ti-Nb	83	TMCP(AcC)	(1)
KE40	Al-Ti-Nb	83	TMCP(AcC)	(1)

Note: (1) Thickness properties Z25 and Z35 are included.

T. Imamura
General Manager

Material and Equipment Department

