

Approval No. ST75RO

Certificate No. TA25771E

***APPROVAL OF MANUFACTURING PROCESS
OF
ROLLED STEELS***

This is to certify that

Jiangsu Shagang Steel Co., Ltd.
Jinfeng Town Zhangjiagang City Jiangsu Province P.R.China

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".

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 from 17 June 2025 until 14 April 2028.
Issued at Tokyo on 17 June 2025.


M. IRISAWA

General Manager

Material and Equipment Dept.

List of PARTICULARS OF APPROVAL

	<u>Ref. No.</u>	<u>MATERIALS</u>
1.	TA24289E	Rolled Steels for Hull (No. 2 Steelmaking Workshop of Hongfa Steelmaking Plant)
2.	TA24290E	Rolled Steels for Hull (3500mm Medium Plate Workshop of Steel Plate Mill)
3.	TA24291E	High Strength Rolled Steels for Offshore Structures (No. 1 Steel Plate Workshop of Steel Plate Mill)
4.	TA24292E	Rolled Steels for Hull (No. 1 Steel Plate Workshop of Steel Plate Mill)
5.	TA24293E	Rolled Steels for Hull (No. 1 Steelmaking Workshop of Hongfa Steelmaking Plant)
6.	TA24294E	High Strength Rolled Steels for Offshore Structures (No. 2 Steel Plate Workshop of Steel Plate Mill)
7.	TA24295E	High Strength Rolled Steels for Offshore Structures (No. 2 Steel Plate Workshop of Steel Plate Mill)
8.	TA25772E	Rolled Steels for Hull (No. 2 Steel Plate Workshop of Steel Plate Mill)
9.	TA24297E	Rolled Steels for Low Temperature Service (No. 2 Steel Plate Workshop of Steel Plate Mill)
10.	TA24298E	Rolled Steels for Low Temperature Service (No. 2 Steelmaking Workshop of Hongfa Steelmaking Plant)

No. : TA24289E

Date : 12 March 2024

PARTICULAR OF APPROVAL

Approval Conditions for Manufacturing Process of Rolled Steels for Hull

1. Manufacturer : Jiangsu Shagang Steel Co., Ltd.,
No. 2 Steelmaking Workshop of Hongfa Steelmaking
Plant
2. Kind of Product : Slabs
3. Type of Steel : Normal Strength Steel and Higher Strength Steel
4. Deoxidation Practice : Fine-grained Killed
5. Grain Refining Elements : Normal Strength Steel : Al and Al-Nb-Ti
Higher Strength Steel : Al-Nb, Al-V-Ti, Al-Ti,
Al-Nb-Ti and Al-Nb-V-Ti
6. Max. Thickness : 320mm
7. Steel Making Process : Basic Oxygen Furnace
8. Casting Process : Continuous Casting
9. Remarks : The individual users of these semi-finished
products are to be approved by the Society for the
manufacturing process of the specific grade of
rolled steel products which are manufactured with
these semi-finished products.

Y. Takao

General Manager

Material and Equipment Department





No. : TA24290E
Date : 12 March 2024

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of Rolled Steels for Hull

- | | |
|----------------------------|---|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.,
3500mm Medium Plate Workshop of Steel Plate
Mill |
| 2. Kind of Product | : Plates |
| 3. Grade | : KA, KB, KD, KE, KA32, KD32, KA36 and KD36
Including Z25/35 through thickness properties |
| 4. Deoxidation Practice | : Fine-grained Killed |
| 5. Grain Refining Elements | : See Table |
| 6. Max. Thickness | : See Table |
| 7. Condition of Supply | : See Table |
| 8. Remarks | : Steel slabs manufactured by Jiangsu Shagang
Steel Co., Ltd., No.2 Steelmaking Workshop of
Hongfa Steelmaking Plant approved by the
Society are to be used. |

(to be cont.)

No. : TA24290E
Date : 12 March 2024

Table Part of Approval Conditions

Grade	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply
KA	Al	40	AR
KB	Al	40	AR
KD	Al	40	CR
	Al-Nb-Ti	40	TMCP(AcC)
KE	Al-Nb-Ti	40	TMCP(AcC)
KA32	Al-Ti	40	CR
	Al-Nb-Ti	40	TMCP(AcC)
KD32	Al-Ti	40	CR
	Al-Nb-Ti	40	TMCP(AcC)
KA36	Al-Ti	40	CR
	Al-Nb-Ti	40	TMCP(AcC)
KD36	Al-Ti	40	CR
	Al-Nb-Ti	40	TMCP(AcC)



 Y. Takao
 General Manager
 Material and Equipment Department

No. : TA24291E

Date : 12 March 2024

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of High Strength Rolled Steels for Offshore Structures

- | | |
|----------------------------|--|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.,
No. 1 Steel Plate Workshop of Steel Plate Mill |
| 2. Kind of Product | : Plates |
| 3. Grade | : KA460, KD460, KE460, KF460, KA620, KD620,
KE620, KF620, KA690, KD690, KE690 and
KF690
Including Z25/35 through thickness properties |
| 4. Deoxidation Practice | : Fine-grained Killed |
| 5. Grain Refining Elements | : Al-Nb-Ti |
| 6. Max. Thickness | : 100mm |
| 7. Condition of Supply | : QT |
| 8. Remarks | : (i) Steel slabs manufactured by Jiangsu
Shagang Steel Co., Ltd., No.1 Steelmaking
Workshop of Hongfa Steelmaking Plant
approved by the Society are to be used.

(ii) Heat treatment process is to be conducted at
Heat treatment workshop of Steel Plate Mill. |



Y. Takao

General Manager

Material and Equipment Department



No. : TA24292E

Date : 12 March 2024

Table: Part of Approval Conditions

Grade	Deoxidation Practice	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KA	Fine-grained Killed	Al	40	AR	-
			60	N	
		Al-Ti	100	N	(1),(2)
KB	Fine-grained Killed	Al	40	AR	-
			60	TMCP(AcC)	
		Al-Ti	100	N	(1),(2)
KD	Fine-grained Killed	Al	40	AR	-
			60	TMCP(AcC)	
		Al-Nb-Ti	100	N	(1),(2)
KE	Fine-grained Killed	Al	60	TMCP(AcC)	-
		Al-Nb-Ti	100	N	(1),(2)
KA32	Fine-grained Killed	Al-Ti	30	AR	-
		Al-Ti	40	CR	(1)
		Al-Nb	40	TMCP(AcC)	-
		Al-Nb-V	60		
		Al-Nb-Ti	100	N	(1),(2)
KD32	Fine-grained Killed	Al-Ti	40	CR	(1)
		Al-Nb	40	TMCP(AcC)	-
		Al-Nb-V	60		
		Al-Nb-Ti	100	N	(1),(2)
KE32	Fine-grained Killed	Al-Nb	40	TMCP(AcC)	-
		Al-Nb-V	60		
		Al-Nb-Ti	100	N	(1),(2)
KF32	Fine-grained Killed	Al-Nb-V	60	TMCP(AcC)	-
		Al-Nb-Ti	100	N	(1),(2)
KA36	Fine-grained Killed	Al-Ti	30	AR	-
		Al-Nb-Ti	40	CR	(1)
		Al-Nb	40	TMCP(AcC)	-
		Al-Nb-V	60		
		Al-Nb-V-Ti	100	N	(1),(2)
KD36	Fine-grained Killed	Al-Nb-Ti	40	CR	(1)
		Al-Nb	40	TMCP(AcC)	-
		Al-Nb-V	60		
		Al-Nb-V-Ti	100	N	(1),(2)
KE36	Fine-grained Killed	Al-Nb	40	TMCP(AcC)	-
		Al-Nb-V	60		
		Al-Nb-V-Ti	100	N	(1)

(to be cont.)

No. : TA24292E

Date : 12 March 2024

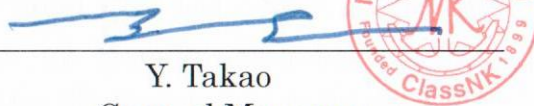
Table: Part of Approval Conditions

Grade	Deoxidation Practice	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KF36	Fine-grained Killed	Al-Nb-V	60	TMCP(AcC)	-
		Al-Nb-V-Ti	100	N	(1),(2)
KA40	Fine-grained Killed	Al-Nb-V	60	TMCP(AcC)	-
		Al-Nb-V-Ti	100	N	(1),(2)
KD40	Fine-grained Killed	Al-Nb-V	60	TMCP(AcC)	-
		Al-Nb-V-Ti	100	N	(1),(2)
KE40	Fine-grained Killed	Al-Nb-V	60	TMCP(AcC)	-
		Al-Nb-V-Ti	100	N	(1),(2)
KF40	Fine-grained Killed	Al-Nb-V	60	TMCP(AcC)	-
		Al-Nb-V-Ti	100	N	(1),(2)

Note :

(1) Thickness properties Z25 / Z35 are included.

(2) Heat treatment process is to be conducted at Heat treatment workshop of Steel Plate Mill.



Y. Takao

General Manager

Material and Equipment Department



No. : TA24293E

Date : 12 March 2024

PARTICULAR OF APPROVAL

Approval Conditions for Manufacturing Process of Rolled Steels for Hull

- | | |
|----------------------------|--|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.,
No. 1 Steelmaking Workshop of Hongfa
Steelmaking Plant |
| 2. Kind of Product | : Slabs |
| 3. Type of Steel | : Normal Strength Steel and Higher Strength Steel |
| 4. Deoxidation Practice | : Fine-grained Killed |
| 5. Grain Refining Elements | : Normal Strength Steel : Al
Higher Strength Steel : Al-Nb, Al-Nb-V, Al-Ti,
Al-Nb-Ti or Al-Nb-V-Ti |
| 6. Max. Thickness | : 320mm |
| 7. Steel Making Process | : Basic Oxygen Furnace |
| 8. Casting Process | : Continuous Casting |
| 9. Remarks | : The individual users of this semi-finished
products are to be approved by the Society for the
manufacturing process of the specific grade of
rolled steel products which are manufactured
with these semi-finished products. |

Y. Takao

General Manager

Material and Equipment Department



No. : TA24294E

Date : 12 March 2024

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of High Strength Rolled Steels for Offshore Structures

- | | |
|----------------------------|--|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.,
No. 2 Steel Plate Workshop of Steel Plate Mill |
| 2. Kind of Product | : Plates |
| 3. Grade | : KA460, KD460, KE460, KF460, KA620, KD620,
KE620, KF620, KA690, KD690, KE690 and
KF690
Including Z25/35 through thickness properties |
| 4. Deoxidation Practice | : Fine-grained Killed |
| 5. Grain Refining Elements | : Al-Nb-Ti |
| 6. Max. Thickness | : 100mm |
| 7. Condition of Supply | : QT |
| 8. Remarks | : (i) Steel slabs manufactured by Jiangsu
Shagang Steel Co., Ltd., No.2 Steelmaking
Workshop of Hongfa Steelmaking Plant
approved by the Society are to be used.

(ii) Heat treatment process is to be conducted at
Heat treatment workshop of Steel Plate Mill. |



Y. Takao

General Manager

Material and Equipment Department



No. : TA24295E

Date : 12 March 2024

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of High Strength Rolled Steels for Offshore Structures

- | | |
|----------------------------|--|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.,
No. 2 Steel Plate Workshop of Steel Plate Mill |
| 2. Kind of Product | : Plates |
| 3. Grade | : KA420, KD420, KE420, KF420, KA460, KD460,
KE460, KF460, KA500, KD500, KE500, KF500,
KA550, KD550, KE550 and KF550
Including Z25/35 through thickness properties |
| 4. Deoxidation Practice | : Fine-grained Killed |
| 5. Grain Refining Elements | : Al-Nb-V-Ti |
| 6. Max. Thickness | : 60mm |
| 7. Condition of Supply | : TMCP (AcC) |
| 8. Remarks | : Steel slabs manufactured by Jiangsu Shagang
Steel Co., Ltd., No.1 Steelmaking Workshop of
Hongfa Steelmaking Plant approved by the
Society are to be used. |


Y. Takao
General Manager
Material and Equipment Department



No. : TA25772E

Date : 17 June 2025

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of Rolled Steels for Hull

- | | |
|----------------------------|---|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.,
No. 2 Steel Plate Workshop of Steel Plate Mill |
| 2. Kind of Product | : Plates |
| 3. Grade | : KA, KB, KD, KE, KA32, KD32, KE32, KF32,
KA36, KD36, KE36, KF36, KA40, KD40,
KE40, KF40 and KE47 |
| 4. Deoxidation Practice | : See Table. |
| 5. Grain Refining Elements | : See Table. |
| 6. Max. Thickness | : See Table. |
| 7. Condition of Supply | : See Table. |
| 8. Remarks | : Steel slabs manufactured by Jiangsu
Shagang Steel Co., Ltd., No.2 Steelmaking
Workshop of Hongfa Steelmaking Plant
approved by the Society are to be used. |

(to be cont.)

No. : TA25772E

Date : 17 June 2025

Table Part of Approval Conditions

Grade	Deoxidation Practice	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KA	Fine-grained Killed	Al	40	AR	(1)
			60	N	(1)
		Al-Ti	100	N	(1),(2)
		Al-Nb-Ti	100	TMCP(AcC)	(1)
KB	Fine-grained Killed	Al	40	AR	(1)
			60	N	(1)
		Al-Ti	100	N	(1),(2)
		Al-Nb-Ti	100	TMCP(AcC)	(1)
KD	Fine-grained Killed	Al	40	AR	(1)
			60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	N	(1),(2)
				TMCP(AcC)	(1)
KE	Fine-grained Killed	Al	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	N	(1),(2)
				TMCP(AcC)	(1)

(to be cont.)

No. : TA25772E

Date : 17 June 2025

Table Part of Approval Conditions (Continued)

Grade	Deoxidation Practice	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KA32	Fine-grained Killed	Al-Ti	30	AR	-
		Al-Ti	40	CR	(1)
		Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	N	(1),(2)
				TMCP(AcC)	(1)
KD32	Fine-grained Killed	Nb-V-Ti	70	TMCP(AcC)	(1)
		Al-Ti	40	CR	(1)
		Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	N	(1),(2)
				TMCP(AcC)	(1)
KE32	Fine-grained Killed	Nb-V-Ti	70	TMCP(AcC)	(1)
		Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	N	(1),(2)
				TMCP(AcC)	(1)
		Nb-V-Ti	70	TMCP(AcC)	(1)
KF32	Fine-grained Killed	Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	N	(1),(2)
KA36	Fine-grained Killed	Al-Ti	30	AR	-
		Al-Nb-Ti	40	CR	(1)
			100	TMCP(AcC)	(1)
		Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)
KD36	Fine-grained Killed	Nb-V-Ti	70	TMCP(AcC)	(1)
		Al-Nb-Ti	40	CR	(1)
			100	TMCP(AcC)	(1)
		Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)
KE36	Fine-grained Killed	Nb-V-Ti	70	TMCP(AcC)	(1)
		Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)
		Nb-V-Ti	70	TMCP(AcC)	(1)
KF36	Fine-grained Killed	Al-Nb	60	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)

(to be cont.)

No. : TA25772E

Date : 17 June 2025

Table Part of Approval Conditions (Continued)

Grade	Deoxidation Practice	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KA40	Fine-grained Killed	Al-V-Ti	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)
KD40	Fine-grained Killed	Al-V-Ti	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)
KE40	Fine-grained Killed	Al-V-Ti	60	TMCP(AcC)	(1)
		Al-Nb-Ti	100	TMCP(AcC)	(1),(3),(4)
		Al-Nb-V-Ti	100	N	(1),(2)
KF40	Fine-grained Killed	Al-V-Ti	60	TMCP(AcC)	(1)
		Al-Nb-V-Ti	100	N	(1),(2)
KE47	Fine-grained Killed	Al-Nb-Ti	100	TMCP(AcC)	(1),(3),(4),(5)

Note :

- (1) Thickness properties Z25 / Z35 are included.
- (2) Heat treatment process is to be conducted at Heat treatment workshop of Steel Plate Mill.
- (3) Including Brittle Crack Arrest Properties "BCA6000" and "BCA8000".
- (4) NRL Drop Weight Test in accordance with the test report approved by the Society on 12 June 2025 may be conducted instead of Double tension type arrest test in order to assure brittle crack arrest properties.
- (5) Min. thickness is over 50 mm.



M. IRISAWA

General Manager

Material and Equipment Department



No. : TA24297E

Date : 12 March 2024

PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of Rolled Steels for Low Temperature Service

- | | |
|----------------------------|---|
| 1. Manufacturer | : Jiangsu Shagang Steel Co., Ltd.
No. 2 Steel Plate Workshop of Steel Plate Mill |
| 2. Kind of Product | : Plates |
| 3. Grade | : KL24A, KL24B, KL27, KL33, KL37 and
KL9N60
Including "Z25" or "Z35" through thickness
properties |
| 4. Deoxidation Practice | : Fine-grained Killed |
| 5. Grain Refining Elements | : See Table |
| 6. Max. Thickness | : See Table |
| 7. Condition of Supply | : See Table |
| 8. Remark | : Steel slabs manufactured by No.2 Steelmaking
Workshop of Hongfa Steelmaking Plant
approved by the Society are to be used. |

(to be cont.)

No. : TA24297E
Date : 12 March 2024

Table Part of Approval Conditions

Grade	Grain Refining Elements	Max. Thickness (mm)	Condition of Supply	Note
KL24A KL24B KL27 KL33 KL37	Al-Nb-Ti	40	TMCP(AcC)	—
KL9N60	Al	50	QT	(1), (2)

Notes :

- (1) Mechanical properties and chemical composition of steel plates with thickness above 40mm are to comply with the relevant requirements for the steel plate with 40mm in thickness specified in 3.4, Chapter 3, Part K of the NK Rules.
- (2) The welding heat input is to be 30kJ/cm or below in the actual welding work.


Y. Takao
General Manager
Material and Equipment Department





No. : TA24298E

Date : 12 March 2024

Table Part of Approval Conditions

Grade	Grain Refining Elements
KL24A KL24B KL27 KL33 KL37	Al-Nb-Ti
KL9N60	Al

Y. Takao
General Manager
Material and Equipment Department





No. : 24EW0820ROL

Date : 12 March 2024

Weldability Confirmation Records

We, Nippon Kaiji Kyokai, have recognized that the weldability confirmation for the following rolled steels under the following welding conditions are conducted with satisfactory results in accordance with the requirements of Chapter 1A, Part 1 of the Society's "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use".

1. Manufacturer : Jiangsu Shagang Steel Co., Ltd.,
No. 2 Steel Plate Workshop of Steel Plate Mill
2. Grade : KA32, KD32, KE32, KA36, KD36 and KE36
3. Deoxidation Practice : Fine-grained Killed
4. Grain Refining Elements : Nb-V-Ti
5. Condition of Supply : TMCP (AcC)
6. Thickness of Test Assemblies : See Table.
7. Welding Method : See Table.
8. Welding Heat Input : See Table.
9. The identification number of "Particulars of Approval Conditions" for the manufacturing process of the steels : TA24288E

The validity of this record will be maintained for the duration of approval of manufacturing procedure of the rolled steels.

(to be cont.)

No. : 24EW0820ROL

Date : 12 March 2024

Table Part of Approval Conditions

Thickness (mm)	Welding Method	Welding Heat Input (kJ/cm)
70	Submerged Arc Welding	100
35, 16	Flux Copper Backing Welding	200


Y. Takao
General Manager
Material and Equipment Department

