

# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:  
**AMM-7349**  
File No:  
**S-SM-RSP**  
Job Id:  
**263.11-002463-7**

**This is to certify:**

That

**Jiangsu Shagang Group Co., Ltd**  
**Zhangjiagang, Jiangsu, China**

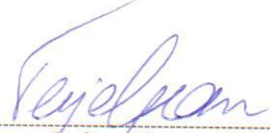
is an approved manufacturer of  
**Steelmaking and Rolled Steel Products**

in accordance with  
**Det Norske Veritas' Rules for Classification Pt. 2**  
**Offshore Standard DNV-OS-B101**

and the following particulars:

<b>Product Grades</b>	<b>Slabs, Plates</b> Hull structural steels, see page 2, Boiler and pressure vessel steels, see page 3
<b>Steelmaking</b>	Basic oxygen converter, Continuous casting
<b>Deoxidation</b>	Killed
<b>Fine grain elements</b>	See pages 2 and 3
<b>Delivery conditions</b>	See pages 2 and 3
<b>Max. thickness</b>	See pages 2 and 3

**Høvik, 2015-03-12**  
for **DNV GL**

  
for **Hanne Anita Hjerpetjønn**  
**Head of Section**



DNV GL local office:  
**Jiangyin**

This Certificate is valid until  
2018-12-31

  
**Dechun Lou**  
**Surveyor**

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**Particulars of the approval for production lines No.1 and No.2:**

**Semis for rolling stock: Slabs**

Grade	Steelmaking <sup>1)</sup>	Fine grain treatment	Max. thickness (mm)
NV A, NV B, NV D, NV E	BOC, CC	Al, Nb, V or Ti either singly or in any combination	Not applicable
NV A32, NV A36, NV A40, NV D32, NV D36, NV D40, NV E32, NV E36, NV E40, NV F32, NV F36, NV F40	BOC, CC		
NV A620, NV A690, NV D620, NV D690, NV E620, NV E690	BOC, LF, RH; CC	Al+Nb+Ti	

Remarks:

- 1) BOC: Basic Oxygen Converter; LF: Ladle Furnace; RH: Ruhrstahl Heraeus; CC: Continuous Casting.

**Final products: Steel Plates**

<b>Normal Strength Steels:</b>					
Grade	Steelmaking <sup>1)</sup>	Fine grain treatment	Delivery condition <sup>2)</sup>	Max. thickness (mm)	Z-quality
NV A, NV B	BOC, CC	Al	AR	40	-
NV A, NV B	BOC, CC	Al+Ti	NR	60	Z35
			N	100	Z35
NV D	BOC, CC	Al or Al+Ti	AR	35	Z35
NV E	BOC, CC	Al	TM	40	-
NV D, NV E	BOC, CC	Al+Nb+Ti	TM	60	Z35
			N	100	Z35
<b>High Strength Steels:</b>					
Grade	Steelmaking <sup>1)</sup>	Fine grain treatment	Delivery condition <sup>2)</sup>	Max. thickness (mm)	Z-quality
NV A32, NV A36, NV D32, NV D36, NV E32, NV E36, NV F32, NV F36	BOC, CC	Al+Nb or Al+Nb+Ti	TM	60	Z35
NV A32, NV D32, NV E32, NV F32	BOC, LF, RH; CC	Al+Nb+V+Ti	N	100	Z35
NV A32, NV D32	BOC, CC	Al+Ti	NR	40	Z35
NV A36, NV D36		Al+Nb+Ti			
NV A32, NV A36	BOC, CC	Al+Nb+Ti	AR	30	-
NV A40, NV D40, NV E40, NV F40	BOC, CC	Al+Nb+Ti or Al+Nb+V+Ti	TM	60	Z35
NV A36, NV D36, NV E36, NV F36, NV A40, NV D40, NV E40, NV F40	BOC, LF, RH; CC	Al+Nb+V+Ti	N	100	Z35

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**Final products: Steel Plates (Continued)**

<b>Extra High Strength Steels:</b>					
Grade	Steelmaking <sup>1)</sup>	Fine grain treatment	Delivery condition <sup>2)</sup>	Max. thickness (mm)	Z-quality
NV A420, NV A460 NV D420, NV D460 NV E420, NV E460	BOC, LF, RH; CC	Al+Nb+Ti	QT	100	Z35
NV A550, NV A620, NV D550, NV D620, NV E550, NV E620	BOC, LF, RH; CC	Al+Nb+Ti	QT	100	Z35
NV A690, NV D690, NV E690 <sup>3)</sup>	BOC, LF, RH; CC	Al+Nb+Ti	QT	85	Z35

Remarks:

<sup>1)</sup> BOC: Basic Oxygen Converter; LF: Ladle Furnace; RH: Ruhrstahl Heraeus; CC: Continuous Casting.

<sup>2)</sup> AR: As Rolled; NR: Normalising Rolling; N: Normalising; TM: Thermo-Mechanical rolling;  
 QT: Quenching and Tempering.

<sup>3)</sup> Maximum welding heat input is 3.8 kJ/mm.

**Steel Plates**

<b>Boiler and Pressure Vessel Steels:</b>					
Grade	Steelmaking <sup>1)</sup>	Fine grain treatment	Delivery condition <sup>2)</sup>	Max. thickness (mm)	Z-quality
NV 360-0N, NV 360-1FN, NV 410-0N, NV 410-1FN, NV 460-0N	BOC, CC	Al+Ti	NR	40	Z35
NV 490-0N, NV 490-1FN	BOC, CC	Al+Nb+Ti	NR	40	Z35

Remarks:

<sup>1)</sup> BOC: Basic Oxygen Converter; CC: Continuous Casting.

<sup>2)</sup> NR: Normalising Rolling