



DNV

DET NORSKE VERITAS

APPROVAL OF MANUFACTURER

CERTIFICATE

CERTIFICATE NO. AMM-5903

This is to certify that

**Heavy Plate Mill of Medium and Heavy Plate Plant
of Angang Steel Co., Ltd**
ANSHAN, 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:

Product	Plates and slabs
Grades	Hull structural steels, see page 2 and 3 Steels for boilers and pressure vessels, see page 3 Steels for low temperature service, see page 4
Steelmaking	Basic oxygen converter, continuous casting
Deoxidation	Killed
Fine grain elements	See table pages 2 and 3
Delivery conditions	See table pages 2 and 3
Max. thickness	See table pages 2 and 3
Remarks	Including Hull Structural steels intended for welding with high heat input

Place and date

Høvi 2012-11-01

for DET NORSKE VERITAS AS

Harsørn S. Tøthgar

Harsørn Tøthgar

Head of Section



Local Office
DNV Dalian

This Certificate is valid until

2016-12-31

Bjørn Inge Andersen

Bjørn Inge Andersen

Surveyor

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 10,000,000. This provision 'Det Norske Veritas' shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Particulars of the approval:

Steel Plates:

<i>Normal Strength Steels:</i>					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV A	BOC, CC	Al	AR	40	-
		-	AR	40	-
		Al	TM	100	Z35
NV B	BOC, CC	Al	AR	40	-
		Al	N	40	-
		Al	TM	100	Z35
NV D	BOC, CC	Al	CR	40	-
		Al	N	40	-
		Al+Nb	CR	40	-
		Al+Nb	N	40	-
		Al	TM	100	Z35
NV E	BOC, CC	Al	N	40	-
		Al	TM	100	Z35
<i>High Strength Steels:</i>					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV A32	BOC, CC	Al+Nb+V	CR	40	-
		Al+Nb+V	N	40	-
		Al	CR	40	-
		Al	N	40	-
		Al+V+Nb+Ti	TM	100	Z35
NV D32	BOC, CC	Al+Nb+V	CR	40	-
		Al+Nb+V	N	40	-
		Al+V+Nb+Ti	TM	100	Z35
NV A36, NV D36	BOC, CC	Al+Nb+V	N	40	-
		Al+V+Nb+Ti	TM	100	Z35
NV E32, NV E36	BOC, CC	Al+Nb+V	N	40	-
		Al+V+Nb+Ti	TM	100	Z35
NV A40, NV D40, NV E40, NV F40, NV F40	BOC, CC	Al+V+Nb+Ti	TM	100	Z35

Remarks: :

¹⁾ BOC: Basic Oxygen Converter; CC: Continuous Casting.

²⁾ AR: AS Rolled; CR: Controlled Rolled; N: Normalised; TM: Thermo-Mechanical rolling.



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Normal Strength Steels intended for welding with high heat input³⁾:					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV A-W100, NV B-W100 NV-D-W100, NV E-W100	TDS, LD, CC	Al	TM	100	Z35
High Strength Steels intended for welding with high heat input³⁾:					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV A32-W100, NV D32-W100 NV E32-W100, NV A36-W100 NV D36-W100, NV E36-W100 NV A40-W100, NV D40-W100 NV E40-W100	TDS, LD, CC	Al	TM	100	Z35
Extra High Strength Steels:					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV A420, NV A460, NV A500, NV A550, NV D420, NV D460, NV D500, NV D550, NV F420, NV F460, NV E500, NV E550, NV F420, NV F460, NV F500, NV F550	BOC, CC	Al+Ni+Ti	TM	80	Z35
Boiler and Pressure Vessel Steels:					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV 360-0A, NV 410-0A, NV 460-0A	BOC, CC	Al	AR	90	-
NV 410-0N, -1FN	BOC, CC	Al	AR	90	-
NV 290-0N, -1FN NV 360-0N, -1FN, NV 410-0N, -1FN NV 460-0N, -1FN, NV 490-0N, -1FN,	BOC, CC	Al+Nb+V	N, CR, TM	90	-

TDS: Torpedo-car Desulfurization; LDC: Lenz Denawitz Converter; BOC: Basic Oxygen Converter; CC: Continuous Casting

AR: Ac Roll; CR: Core Roll; Ni: Ni; Nb: Niobium; Ti: Titanium; TM: Thermally Mechanical Treatment

Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
and tempered Specially approved according to IACS-W11, Appendix B.		Al+V	TM		5
		Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:



Nickel Alloy Steels for Low Temperature Service:					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV 1.5 Ni, NV 3.5 Ni, NV 5 Ni, NV 9 Ni	BOC, CC	Al	QT	40	-

Remarks:
¹⁾ BOC: Basic Oxygen Converter; CC: Continuous Casting.
²⁾ QT: Quenched and tempered

Carbon- Manganese Steels for Low Temperature Service:					
Grade:	Steelmaking ¹⁾ :	Fine grain treatment:	Delivery condition ²⁾ :	Max. Thickness (mm):	Z-quality:
NV 360 - 2FN	BOC, CC	Al	N	40	-
		Al	TM	50	Z35
NV 2 - 2	BOC, CC	Al	N	40	-
		Al+Ni+V	N	40	-
		Al	TM	50	Z35
		Al+V+Ni+Ti	TM	50	Z35
NV 2 - 3	BOC, CC	Al	N	40	-
		Al+Ni+V	N	40	-
		Al	TM	50	Z35
		Al+V+Ni+Ti	TM	50	Z35
NV 2 - 4	BOC, CC	Al+V+Ni+Ti	TM	50	Z35
NV 2 - 4L	BOC, CC	Al+Ni+V+Ti	TM	50	Z35
NV 4 - 2	BOC, CC	Al+Ni+V	N	40	-
		Al+Ni+V+Ti	TM	50	Z35
NV 4 - 3	BOC, CC	Al+Ni+V	N	40	-
NV 4 - 4	BOC, CC	Al+Ni+V+Ti	TM	50	Z35
NV 4 - 4L	BOC, CC	Al+Ni+V+Ti	TM	50	Z35

Remarks:
¹⁾ BOC: Basic Oxygen Converter; CC: Continuous Casting.
²⁾ N: Normalised; TM: Thermo-Mechanical

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