

Germanischer Lloyd SE • P.O. Box 11 16 06 • 20416 Hamburg/Germany

Shanxi Taigang Stainless Steel Co., Ltd.
Stainless Steel Hot Rolling Mill
Attn. Mr. Gao Jian Bing
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China

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Your reference	Your Letter of	Our reference	Extension	Date
		068670-13/OKoe	+49 40 3 61 49-4561	2013-07-12

Approval of your works for the manufacture of steel plates (prolongation)

Dear Mr. Gao Jian Bing,

Thank you for your company's commitment to manufacture products with GL certification.

We refer to our Surveyor's report on the inspection of our client's works performed on 2013-06-14 and to his confirmation that the results of acceptance tests with reference to "The Testing Plan for Prolongation of Works Approval of Austenitic and Duplex Stainless Steel Plate for Ships" dd. May, 2013 approved by GL with our ref. no. 044088-13 dd. 2013-05-06 carried out on hot rolled steel plates made of austenitic stainless steel 316L acc. to ASTM A240 and austenitic-ferritic stainless steel S31803 acc. to ASTM A240 each with thickness of 20 mm for the supply condition "solution annealed + quenched" (S+Q) witnessed by him are in full compliance with our Rules for Materials.

Therefore the preconditions for prolongation of approval of your works granted by our letter ref. no. 087811-10 dated 2010-08-11 are complied with.

The material grades, supply conditions and dimensions / weights covered by the approval are indicated in the approval annex.

The manufacturing details covered by the approval are as follows:

1. Products

Hot rolled steel plates made of austenitic stainless steels with specified low temperature properties for the fabrication of cargo tanks and process pressure vessels for carrying liquefied gases as well as hot rolled steel plates made of austenitic and austenitic-ferritic stainless steels intended for the fabrication of cargo tanks of chemical tankers, pressure vessels and other vessels, for which chemical stability in relation to the cargo or operating fluid is required

2. Manufacturing process

Stainless Steelmaking Plant

Electric arc furnace (EAF), converter refining process by Argon Oxygen Decarburization (AOD), secondary metallurgy by ladle furnace (LF), continuous casting by vertical-type continuous slab caster, cutting, grinding, marking, stamping, final inspection, despatch

Stainless Steel Hot Rolling Mill

Inspection and preparation of raw material, reheating of con-cast slabs from Steelmaking Shop No.3 by walking beam furnace or pusher-type furnace, descaling by high water pressure, hot rolling process by 2-high reversible roughing mill and 4-high reversible finishing mill, straightening by 4-high 7-roll hot plate leveller, cooling by cooling bed, heat treatment, shot blasting,



straightening by cold plate leveller, non-destructive testing (NDT) by ultrasonic testing (UT), radiographic testing (RT), magnetic particle inspection (MT) and / or penetrant testing (PT), surface checking and clearance, shearing by crop shear, edge trimming by rotary side trimmer, shearing by dividing shear, pickling, grinding, marking, finishing, final inspection, despatch

3. Prematerial suppliers

Only material manufacturers which are approved by GL for the relevant products

4. Fabrication welding

Not permitted

Our approval is granted under provision that all plates intended to be used for the outfit of ships classed with our Society will comply with our Rules in all respects and will be tested in the presence of our Surveyor.

The quality of your company's manufactured products, within the valid approved scope, contributes to the safety and reputation of GL classed ships.

Your company has been added to the list of approved manufacturers, which is regularly published on the Internet. In order to view the appropriate data start the GL website <http://www.gl-group.com> , from the menu "GL Tools" select "Approval Finder", and then "Manufacturers of Materials".

Enclosed please find our certificate of approval no. **WZ 1950 HH 2**, valid until 2016-06-30, as well as the corresponding annex.

We thank you for your cooperation and wish your company every success.

Yours faithfully,

Germanischer Lloyd



Stefan Röhr



Oliver Krömer

Ref. no.: 068670-13



Manufacturer: Shanxi Taigang Stainless Steel Co., Ltd.

Stainless Steel Hot Rolling Mill

List 1: Plates, Strips, Sections and Bars, Prematerial

Grade Remarks	Key	Supply Condition (1)	min. Thick- ness, mm	max. Thick- ness, mm	Casting Method (2)	Deoxidation	Microalloy
1.4301 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4306 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4307 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4401 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4404 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4435 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4436 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4541 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4550 acc. to EN 10028-7	BL	S+Q	6	40	CC	killed	acc. to standard
1.4301 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4306 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4307 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4362 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4401 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4404 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4435 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4436 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4462 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
1.4541 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard

(1):

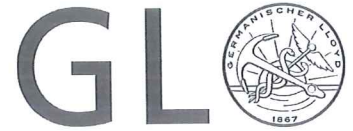
AC, AF, AR = as cast, as forged, as rolled
 CR = controlled rolled
 F = ferritized
 HF = hot formed
 N = normalized

N+T = normalized + tempered
 Q+T = quenched + tempered
 SH = surface hardened
 S+Q = solution annealed + quenched
 TM = thermomechanically rolled

(2):

CC = continuous casting
 IC = ingot casting

Ref. no.: 068670-13



Manufacturer: Shanxi Taigang Stainless Steel Co., Ltd.

Stainless Steel Hot Rolling Mill

Grade Remarks	Key	Supply Condition (1)	min. Thick- ness, mm	max. Thick- ness, mm	Casting Method (2)	Deoxidation	Microalloy
1.4550 acc. to EN 10088-2	BL	S+Q	6	40	CC	killed	acc. to standard
304 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
304L acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
316 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
316L acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
321 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
347 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
S31803 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
S32205 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard
S32304 acc. to ASTM A240	BL	S+Q	6	40	CC	killed	acc. to standard

Key: BD Strip BF Wide Flats BL Plate FO Sections HZ Prematerial (Ingots, Slabs, Billets) ST Bars WFS Bulbflatbars

(1):

AC, AF, AR = as cast, as forged, as rolled
 CR = controlled rolled
 F = ferritized
 HF = hot formed
 N = normalized

N+T = normalized + tempered
 Q+T = quenched + tempered
 SH = surface hardened
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(2):

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Approval of Material Manufacturers
Zulassung von Werkstoffherstellern



This is to certify that the works of
Hiermit wird bescheinigt, dass die Firma

**SHANXI TAIGANG STAINLESS STEEL CO., LTD.
STAINLESS STEEL HOT ROLLING MILL
TAIYUAN, SHANXI PROVINCE
CHINA**

has been subjected to an approval test in accordance with the Society's Rules with satisfactory results and is approved for the manufacture of the following products:

einer Zulassungsprüfung nach den Vorschriften des Germanischen Lloyd unterzogen wurde und für die Herstellung folgender Erzeugnisse zugelassen ist:

**Steels for Cargo Tanks
in accordance with the GL-Rules for Metallic Materials,
Chapter 2, Section 1.F**

**Stainless Steels
in accordance with the GL-Rules for Metallic Materials,
Chapter 2, Section 1.G**

This approval is granted provided that all products intended to be used for the construction of ships or installations classed with Germanischer Lloyd comply in every respect with the Society's Rules and Requirements.

Die Zulassung erfolgt unter der Voraussetzung, dass alle Erzeugnisse, die zum Bau von Schiffen und Anlagen mit Klasse des Germanischen Lloyd bestimmt sind, die Vorschriften des Germanischen Lloyd in jeder Hinsicht erfüllen.

Certificate of approval No.
Zulassungsbescheinigung Nr.

WZ 1950 HH 2

This Certificate is valid until:
Diese Bescheinigung ist gültig bis:

2016-06-30

Part of the approval is our letter of approval ref. no. 068670-13 of 2013-07-12.
Bestandteil der Zulassung ist das Zulassungsanschreiben, Tgb.-Nr. 068670-13 vom 2013-07-12.

Hamburg, 2013-07-12

Germanischer Lloyd

i.A.
Stefan Röhr

i.A.
Oliver Krömer