GLEN FLANGE limited
FOCUS ON MARINE INDUSTRY

WELD OVERLAY INTRODUCTION

COMBINED CASTING THE HIGH-QUALITY GOODS THE GOOD FAITH TO WIN THE WORLD

PROFESSIONAL

INTEGRITY

INNOVATION

DEVELOPMENT

CONTENTS

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Weld Overlay Characteristics

1.**Weld overlay equipments are all from abroad** , main power supply, heater power circuit, wire feeder are all imported with original packaging from Austria FROUNIS.(Type: TT5000\TT220, FROUNIS is the first brand of weld overlay processing in petrochemical valves industry in the global.

2.**All workshops are anti-pollution** designed to insure all the process of weld overlay without the pollution of dust and the best quality of products.

3.**Possess high technical maturity of weld overlay**, to pursue better quality and higher efficiency by consist producing inspection of weld overlay crafts and non-stop improvement; affording fully automated hot-wire Tig and T-Tig weld overlay solution, including two types: single wire and double wire, single layer and double layer, welding technology in accordance with standards of ASME, NACE, API, dilution rate can reach within 5%.

4.**Building strict standards of post welding testing** which all according to API Spec Q1 (Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas) and ISO9001:(Quality management systems requirements also contain API Spec 5LDecification for anti-corrosion alloy membrane or steel lining as main reference for quality management.

Why Need Weld Overlay?

Because of high quantity of H2S, O2, erchloride and other corrosive medium exist in lots of valves and pipes which are used in deep-water drilling and coal chemical industry, so to make the equipments have better performance of anti- erosion, longer service life and lower manufacturing cost, some developed countries led by USA API adapting a manufacturing way which is weld overlay a nickel layer on the surface of low alloy valve body, valve deck, pipe fitting. In this way, drilling equipment can keep low cost of low alloy material, and the expensive nickel alloy material can used in other field.

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Weld Overlay Strength

Weld overlay production range includes: oil and gas wellhead equipment, Christmas tree, API6A Valve, pressure vessel parts, Hydrogenation reactor unit as well as all require the ability of corrosion ordinary pipes, valves, flanges and pipes and pipe fittings etc. All the weld overlay process is programmed, and the equipment automatically completed weld overlay.

---- **Weld overlay pipe, heat-sensitive elbow**

Pipe base material (including but not limited to)

ASTM A53 B, A106 Gr. B, API5L B, X42, X53, X60, X65, X70; ASTM A333 GR.6

Stainless steel

Parent tube thickness: 6mm ～75mm; weld overlay elbow technique: thermal bending and cold bending.

Pipe nominal diameter: 50mm ～800mm; valves and flanges and pipe fittings weld overlay

Pipe length: reach a length of 12.5meters ; weld overlay internal diameter: 38mm-1800mm;

Bending semi diameter: 3D-8D(or customized size by customers)

---- **Valves base material** (including but not limited to)

ASTM A216 WCB, WCC, A352 LCC

---- **Flanges base material** (including but not limited to)

ASTM A105, ASTM A350 LF1, LF2 CL1/ CL2, LF3 CL1/CL2; ASTM A694 F42, F52, F60, F65, F70; ASTM A 182 F304/304L, F316/ 316L, API 45K, 60K, 75K; AISI 4130 (M), 4140, 4340, 8630(M)

---- **Pipe fittings base material**(including but not limited to)

ASTM A234 Grade WPB, WPC, WP11, WP22; ASTM A420 WPL6ASTM A860 WPHY42, WPHY52, WPHY60, WPHY65, WPHY70; X52, X60, X65, X70

---- **The other components**

ASTM A516 GR. 60/ GR.70

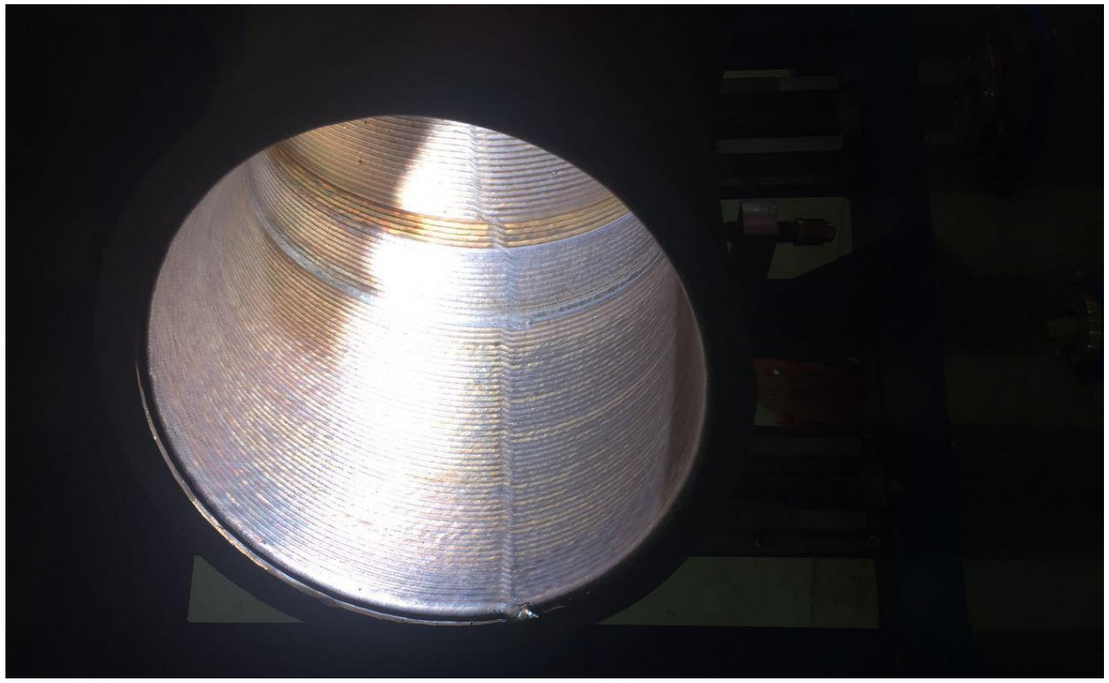
---- **The other materials requirements**

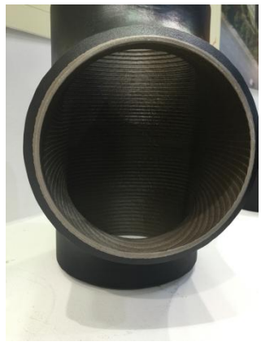
Weld overlay layer material (including but not limited to)

Stainless steel 304/304L and 316/ 316L, 904L, Incomel600 ®/ 625 and Incoloy ®800/ 825

Duplex stainless steel: SS3.1803, SS32750, SS32760, Hastelloy ®C 276 and C22 Monel K-500

Weld Overlay Pipe、Flange、Tee、





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Weld Overlay Inspection

We, GlenFlange have a standard certification meet the domestic and abroad, qualified and experienced staff to use NDT technology to ensure the highest quality of the products and the possibility of welding process. After inspection, they will issue the final inspection documents, including the classification of inspection methods and acceptance criteria.

--- **Radiographic Flaw Detection—RT**

The professional non-destructive make a RT test, they are all qualified personals which of many years of work experience.

---- **Dye Penetration Test—DPT**

All parts that need to be welded must be tested before and after reweld overlay. When testing pipe inner diameter, it requires to use remote-video detection & inspection technology. We can usually detect the inside of pipeline up to 12M.

---- **Materials Chemistry Component Inspection—PMI**

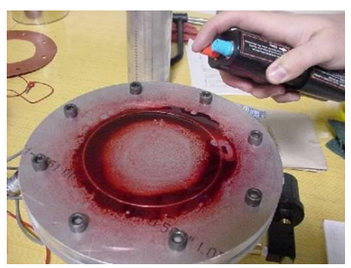
With 26 channel the world's most advanced mobile online PMI equipment, recheck the chemical composition of base material and overlaying welding layer. The report is stored directly on the PMI device computer, archived completely and ascended.

------ **Ultrasonic Testing—UT**

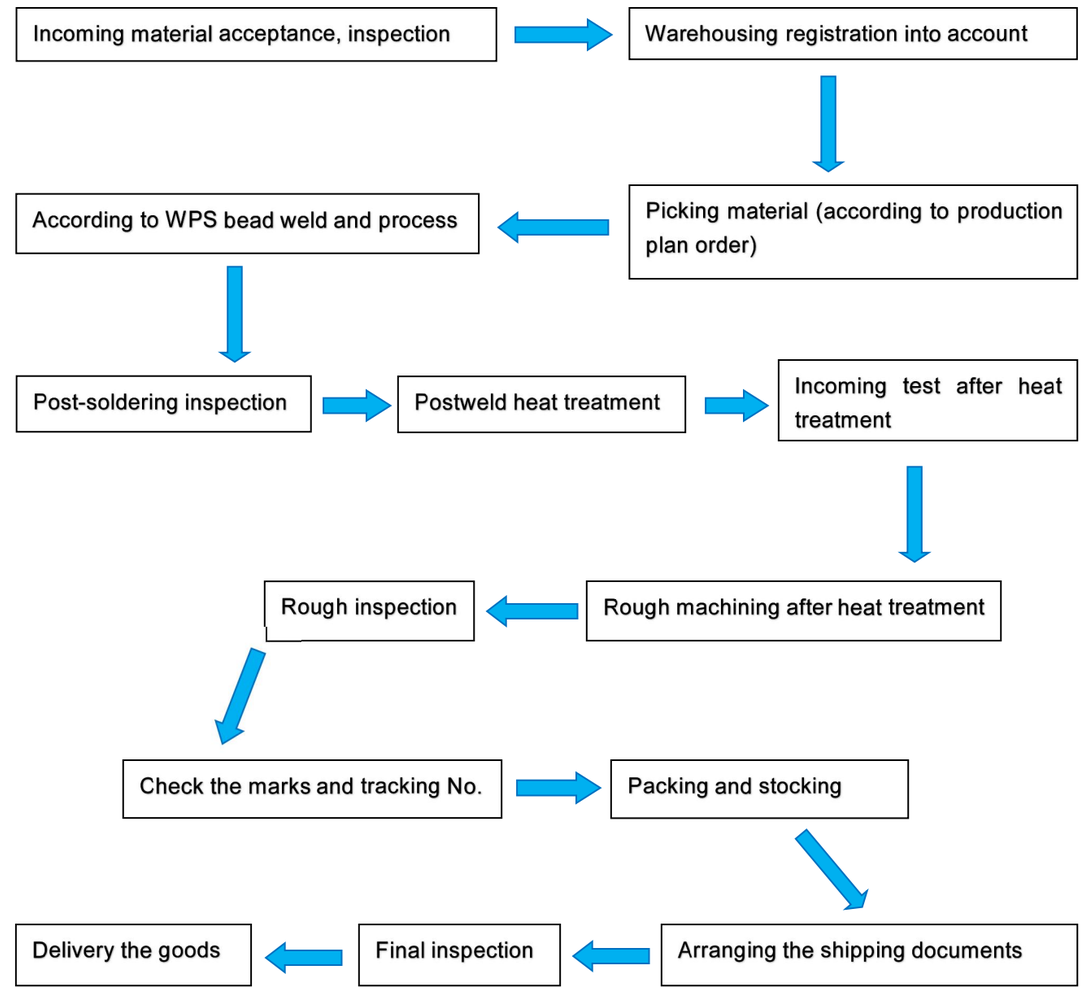
Using the world most advanced transverse wave and standing wave detector to test the integrity of the weld overlay layer and base material to ensure the bead weld quality. GlenFlange make the measurement in accordance with the customer's welding thickness standards strictly.

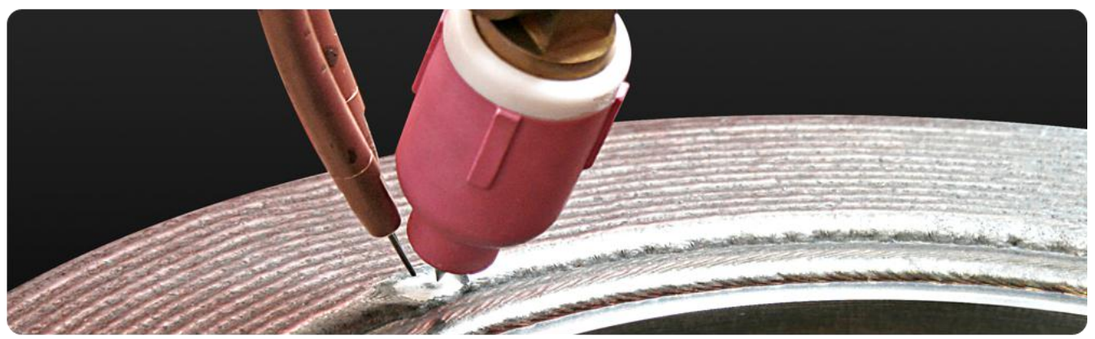
----- **Magnetic particle Testing—MT**

After completing all manufacturing phase, test the surface spots in the ferromagnetism components, using fluorescence or visual technology.



GlenFlange Weld Overlay Project Management Steps





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Weld Overlay Quality Assurance Plan

Record during producing should in including below:

Certificate of qualification. (The final certification of qualification of products, ensuring products leave factory under strict quality inspection.)

Mate's receipt of base metal and welding material (Must meet the standards of quality system)

QC procedure (Quality control system)

(ITP) **Quality control planning**

(PMI) **Positive Material Identification** (chemical analysis of final welding layer)

Non-destructive testing reports adapting standards of VT RT UT MT PT

WPSs/ PQRs Standards welding procedure specification /Procedure Qualification Record(The basis of welding process parameters adapted by products)

Size / Final inspection report

Trceability: generating an identifiable welding line record or chart for each welding line, including base metal for welding (heat number, batch number, serial number), Standards welding procedure specification, main parameters of welding, welder or equipment identification, non-destructive testing results, non- destructive testing report number, PMI result and so on.

Weld Overlay base tube nominal size (API 5LD-2009)	
Diameter	**Ovality**
Pipe body Seamless steel pipe OD±0.75%,welding tube external diameter upper deviation control 0.75% of external diameter size,lower deviation control 0.25%of external diameter size, (+0.75%D-0.25D), maximum ⩽±3.2mm (0.125in) D:pipe external diameter	**Pipe body** ovality DL control 1.5%of external diameter size,maximum⩽10mm(0.396in)
Pipe end distance from the pipe within100mm(4in)	**Pipe end** Distance from the pipe end within 100mm (4in) ovality DL ⩽1%of outside diameter,and ⩽5mm(0.196in)
	DL for pipe body and pipe end ⩽200mm(8in), inner ovality DL ⩽025% outside diameter, maximum ⩽ 2mm(0.097in)
T Wall Thickness Tollerance	
Base metal refer to APL5L-2007,Table11	**Weld Overlay layer** 0-2mm(0.079in)

Base metal tollerance refer to APL5L-2007	
Wall Thickness t mm(in)	**T** mm(in)
Seamless Steel Pipe	
t ⩽4.0(0.157)	+0.6(0.024) -0.5(0.020)
4.0(0.157) < t < 25.0(0.984)	+0.150t -0.125t
t⩾25.0(0.984)	+3.7(0.146) or +0.1t choose bigger one, -3.0(0.120)or -0.1t choose smaller one
Weld Pipe	
t⩽5.0(0.197)	±0.5(0.020)
5.0(0.197)＜t＜15.0(0.591)	±0.1t
t⩾15.0(0.591)	±1.5(0.060)

Note:When O.D ≥355.6 mm(14 in) but wall thickness≥25.0mm(0.984 in), the value of Tolerance should be added 0.05t, the ID of overlay welding: 38mm-1800mm

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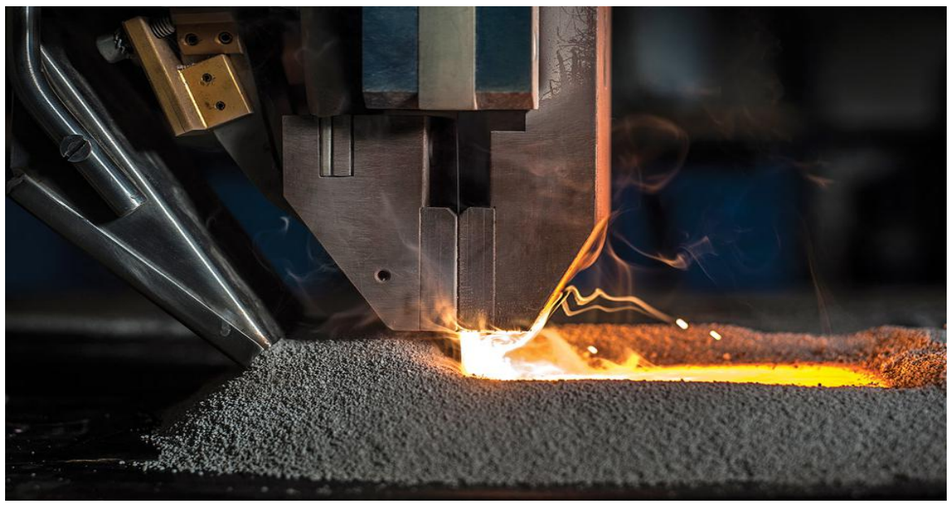
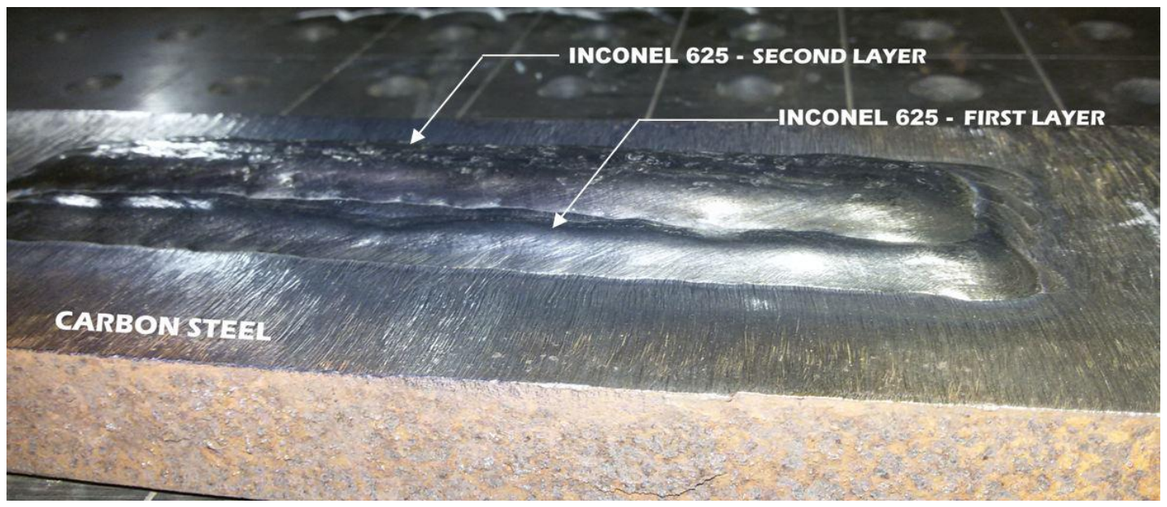
Weld Overlay Equipment





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Qualification Certificate


ABS

CERTIFICATE NO: 11-MMPS-PF&PAC-337
EFFECTIVE DATE: 26 OCTOBER 2011

CERTIFICATE OF
FORGING FACILITY AND PROCESS APPROVAL

BASED ON ENGINEERING REVIEW AND A PLANT SURVEY OF THE FACILITY, IT IS HEREBY CERTIFIED THAT,

GLEN FLANGE LTD.,
CHONGQING PROVINCE, P.R.CHINA

IS APPROVED TO PRODUCE STEEL FORGINGS FOR USE IN MARINE APPLICATIONS AS OUTLINED IN ABS DALIAN PORT OFFICE SURVEY REPORT NO. DL2059570-A, DATED 26 OCTOBER 2011 AND APPROVAL LETTER ISSUED.

THIS APPROVAL IS VALID FOR FIVE YEARS FROM THE EFFECTIVE DATE ON THIS CERTIFICATE, THE RELEVANT ABS RULES ARE TO BE ADHERED TO IN ALL RESPECTS, AND PRODUCTION, INSPECTION, AND TESTING OF THE FORGINGS ARE TO BE TO THE SATISFACTION OF THE ATTENDING ABS SURVEYOR.

Gopal Magadi
Manager
ABS Materials, Houston


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Certificate number: SMS.M.K/12728.0

www.veristar.com

RECOGNITION FOR
BV MODE II SCHEME

Glen flange Ltd
Chongqing - CHINA

Summary of the range of the recognition which is detailed in the subsequent page(s):
Forging
Max. weight: 800kg

This certificate will expire on: 17 May 2013

For BUREAU VERITAS,
At BV SHANGHAI, on 30 Mar 2010,
Jennifer Zhang


NIPPON KAIJI KYOKAI

Certificate No. NKM-1184CF

APPROVAL OF MANUFACTURING PROCESS

This is to certify that

Glen Flange Ltd.
Chong qing
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 3, Part 1 of the Society's "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use".

MATERIALS : Carbon Steels
Stainless Steels

PROCESS : Forging

REMARKS : Raw materials manufactured by the maker approved by the Society are to be used.

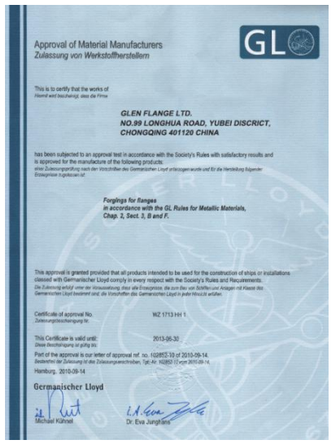
On this effect, the products for the ships classed with the Society are to be manufactured, tested and inspected in compliance with the Rules.

This certificate is valid until the 20th day of July, 2016.
Issued at Tokyo on the 11th day of November, 2011.

Renewal Date : 11th November, 2011

H. Takano
General Manager
Material and Equipment Department

ClassNK


Approval of Material Manufacturers
Zulassung von Werkstoffherstellern

GL

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

GLEN FLANGE LTD.
NO.99 LONGHUA ROAD, YUBEI DISCRICT,
CHONGQING 401120 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 der Vorschriften der Germanischen Lloyd erfolgreich wurde und für die Herstellung folgender Erzeugnisse zugelassen ist:

Forgings for flanges
in accordance with the GL Rules for Metallic Materials,
Chap. 2, Sect. 3, B and F.

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 1713 Hrl 1

This Certificate is valid until:
Diese Bescheinigung ist gültig bis 2013-06-30

Part of the approval is our letter of approval ref. no. HH852.10 of 2010-09-14.
Bestandteil der Zulassung ist das Zulassungsschreiben, Typ/-Nr. HH852.10 vom 2010-09-14.

Hamburg, 2010-09-14

Germanischer Lloyd

Michael Kühnel
Dr. Eva Junghans


DNV

DET NORSKE VERITAS
APPROVAL OF MANUFACTURER
CERTIFICATE

CERTIFICATE NO. AMM-5384

This is to certify that
Glen Flange Ltd.
Chongqing, 401120, China
is an approved manufacturer of
Steel Forgings
in accordance with
Det Norske Veritas' Rules for Classification Pt. 2
Offshore Standard DNV-OS-B101
and the following particulars:

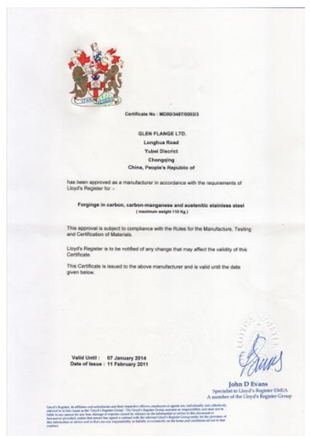
Steel types: Carbon and carbon-manganese, Austenitic stainless
Max. weight: 100 kg

Place and date
Høvik, 2011-11-04
for DET NORSKE VERITAS AS
Astrid Heimsen Kjesbu
Head of Section

Local Office
DNV Dalian

This Certificate is valid until
2015-06-30
Dechun Lou
Surveyor

DET NORSKE VERITAS AS NO-1322 HØVIK, NORWAY TEL: (+47) 67 57 99 00 FAX: (+47) 67 57 99 11
Form No.: AM 1402a Issue: December 2008 Page 1 of 1


Certificate No : MD00/34870/0313

GLEN FLANGE LTD.
Longhua Road
Yubei District
Chongqing
China, People's Republic of

has been approved as a manufacturer in accordance with the requirements of Lloyd's Register for :-

Forgings in carbon, carbon-manganese and austenitic stainless steel
(maximum weight 110 kg)

This approval is subject to compliance with the Rules for the Manufacture, Testing and Certification of Materials.

Lloyd's Register is to be notified of any change that may affect the validity of this Certificate.

This Certificate is issued to the above manufacturer and is valid until the date given below.

Valid Until : 07 January 2014
Date of Issue : 11 February 2011

John D Evans
Specialist to Lloyd's Register EMEA
A member of the Lloyd's Register Group

CLIENTS

A.P.& A.

FINCANTIERI
Cantieri Navali Italiani S.p.A.

3 MAJ

BRODOSPLIT
BRODOGRAĐEVNA INDUSTRIJA SPLIT d.d.

PSQ

BR PETROBRAS

台灣國際造船股份公司
CSBC CORPORATION,TAIWAN

RDM CONSTRUCTIONS

stx 중공업

GLEN FLANGE limited
FOCUS ON MARINE INDUSTRY

Address: No.99 Longhua Road. Yubei District, Chongqing 401120, China

Tel : +86-23-67964368
Fax: +86-23-67504207
Email: info@glenflange.com
Web: www.glenflange.com