

# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:  
**AMMM00002C2**  
Revision No:  
**1**

**This is to certify:**

**That**

**Iraeta Energy Equipment Co., Ltd.**  
**No.9001 of Jiwang Road, Guanzhuang sub-district office,**  
**Zhangqiu district, Jinan ,**  
**China**

is an approved manufacturer of  
**Steel Forgings**

in accordance with  
**DNV GL rules for classification – Ships**

and the following particulars:

<b>Application area</b>	<b>Forgings for hull structures and equipment Forgings for shafting and machinery Stainless steel forgings</b>
<b>Steel type</b>	<b>Carbon and carbon-manganese, Alloy Austenitic stainless</b>
<b>Forging method</b>	<b>Open die forging, ring rolling</b>
<b>Max. weight</b>	<b>See page 2</b>
<b>Heat treatment condition</b>	<b>see page 2</b>
<b>Additional approval conditions</b>	<b>See page 2</b>

Manufacturer(s) approved by this certificate is/are accepted to deliver according to DNV GL, DNV and GL rules. Materials to be applied to DNV GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at **Hamburg** on **2019-10-24**

for **DNV GL**

This Certificate is valid until **2021-12-31**.

DNV GL local station: **Qingdao**

Approval Engineer: **Christian Wildhagen**

**Thorsten Lohmann**  
**Head of Section**



Job Id: **263.11-004530-3**  
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## Particulars of the approval

### Forgings for hull structures and equipment

Steel type	Grade <sup>3)4)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. thickness [mm]	Max. outer diameter [mm]	Heat treatment condition <sup>2)</sup>
C and C-Mn	VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW	OD, RR	5 000	180	4030	NT
Alloy	VL F550AW, VL F600AW, VL F650AW	OD, RR	3 200	235	2375	QT

### Forgings for shafting and machinery

Steel type	Grade <sup>3)4)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. thickness [mm]	Max. outer diameter [mm]	Heat treatment condition <sup>2)</sup>
C and C-Mn	VL F400U, VL F440U, VL F480U, VL F520U, VL F560U, VL F600U, VL F640U, VL F680U, VL F720U, VL F760U	OD, RR	5 000	180	4030	NT
Alloy	VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL F1100A	OD, RR	3 200	235	2375	QT

### Stainless steel forgings

Steel type <sup>3)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. thickness [mm]	Max. outer diameter [mm]	Heat treatment condition <sup>2)</sup>
Austenitic stainless	OD, RR	450	80	790	SHT

#### Remarks:

- 1) OD: Open die forging  
RR: Ring Rolling
- 2) QT: Quenched and tempered  
N: Normalised  
NT: Normalised and tempered  
SHT: Solution Heat Treated (Solution Annealing)
- 3) Certification of any material applied to classed object shall fulfill the applicable material requirements in the DNV GL class rules
- 4) Incl. equivalent grades in acc. to other standards

#### Special conditions:

Including austenitic stainless steel for approved low-temperature applications