DNV·GL

Certificate No:
TAD00000YZ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Mud and Cementing Equipment

with type designation(s)
Fluid Ends - 4 1/2", 4" and 3 3/8" for 500W Pumps, Fluid Ends - 4 1/2", 4" and 3 1/2", 3" and 2 3/4" for 600S Pumps

Issued to
Yantai Jereh Petroleum Equipment & Technologies Co., Ltd.
Yantai, China

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018

Application :

See next page

Issued at **Høvik** on **2019-08-08**
This Certificate is valid until **2024-08-07**.
DNV GL local station: **Yantai**

Approval Engineer: **Nishant Koti**

for **DNV GL**

Per Esvall
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Job Id: **262.1-025265-1**
Certificate No: **TAD00000YZ**

Reference Standards:

- API Specification 7K, Drilling and Well Servicing Equipment, 6th Edition, 2015
- ASME SEC VIII, Div.2 Boiler & Pressure Vessel Code 2013.

Product description

The triplex fluid end of 600S plunger pump, including 2 ¾", 3", 3 ½", 4" and 4 ½" plunger, is mainly used for cementing and acidizing operations.

The triplex fluid end of 500W plunger pump is mainly used for cementing and acidizing operations.It is divided into 3 3/8", 4" and 4 ½" fluid end as per the working pressure and displacement.

Application/Limitation

Min. design temperature: -29 °C
Max. design temperature: +85 °C

Max. working pressure, MWP, for pump:

Pump Model	Plunger size	MWP	Working Temperature, °C	Corrosion Allowance, mm
500W	3 3/8"	20000 psi	-29 / +85	1
	4"	15000 psi	-29 / +85	1
	4 1/2"	12000 psi	-29 / +85	1
600S	2 ¾"	16836 psi	-29 / +85	1
	3"	15000 psi	-29 / +85	1
	3 1/2"	10394 psi	-29 / +85	1
	4"	7958 psi	-29 / +85	1
	4 1/2"	6288 psi	-29 / +85	1

Type Approval documentation

Tests to be carried out

- Each product is to be tested according to DNVGL's Offshore Standard DNVGL-OS-E101 "Drilling facilities", Ch.2, Sec.6 [4].

Marking of product

For traceability the following marking is to be carried out on each product:
- Part No.
- Serial No.
- Rated Load capacity

Manufacturers Name or Mark

Other conditions and comments

- This TA covers only the "High pressure" side of the pump. (It is assumed, that precaution measures shall be taken to ensure that the function of the pump, and it's parts, remains unrestrained at MDT=-29 °C.)
- The hammer lug unions shall be delivered with DNVGL Product Certificates (PC).

- Charpy testing shall be performed in accordance with Ch.2, Sec.2 of DNVGL-OS-E101 "Drilling facilities", at MDT= -29 °C.
- NDE/NDT procedures shall be performed in accordance with Ch.2, Sec.8 of DNVGL-OS-E101 "Drilling facilities".
- Qualification of welding procedures and qualification of welders shall be in accordance with DNVGL-OS-E101, Ch.2, Sec.8 and DNVGL-OS-C401 Ch.2, Sec.1.
- Each product are to be surveyed during fabrication in accordance with the requirements for equipment of Category I as defined in DNV's Offshore Standard DNVGL-OS-E101 Drilling facilities, followed by issuance of Product Certificate Form No. 20.92a. Fabrication records are to be maintained in accordance with DNVGL-OS-E101 Ch.3, Sec.3 [2].
- This document may be used as part of the documentation required to comply with European Union (EU) Directives referenced in PSA's Acts, regulations and provisions for the petroleum activities. It should however be noted that the scope covered by this document does not necessarily cover all aspects required to issue the EU Declaration of Conformity and to affix the CE-mark. It is the manufacturer's/operator's responsibility to ensure compliance with relevant EU Directives.

Certificate Retention Survey

For retention of the Type Approval, DNV GL's representative shall carry out biennial Product Audits in accordance with DNV GL Type Approval Scheme DNVGL-CP-0338, Chapter 4, dated Oct 2015.