

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Mud and Cementing Equipment

with type designation(s)
Skid, PCS-521B Double Pump Cementing Skid

Issued to
SJS Limited
Jingzhou City Hubei, China

is found to comply with
DNVGL-OS-E101 – Drilling plant, Edition July 2015

Application :

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This Certificate is valid until **2022-02-19**.

Issued at **Houston** on **2017-02-20**

DNV GL local station: **Wuhan CMC**

for **DNV GL**

Approval Engineer: **M. Kevin Mandeville Jr.**

Christian Nilsen
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.

Job Id:
Certificate No: **TAD00000KM**

The following codes and standards were used as a reference:

API Specification 7K, *Specification for Drilling and Well Servicing Equipment*, 5th Edition

Product description

PCS-521B Double Pump Cementing Skid, with options of water or air cooling and ladders on the right or left side.

B01-00-236 contains four configurations:

Part	Air Cooling		Water Cooling	
	Left Ladder	Right Ladder	Left Ladder	Right Ladder
Skid	B01-31-210	B01-31-198	B01-31-214	B01-31-212
Engine	B01-42-124		B01-42-127	
Hydraulic	B01-23-475		B01-23-476	
Platform	B01-26-258	B01-26-259	B01-26-258	B01-26-259
Mixing tank	B01-09-781	B01-09-782	B01-09-781	B01-09-782

Application/Limitation

Design Parameter	Value	Equivalent
Minimum Working Temperature	-20°C	-4°F
Maximum Working Temperature	55°C	131°F
Maximum Pressure (High Pressure Side)	105 MPa	15,000 psi
Hydraulic System Pressure Rating	34.4 MPa	5,000 psi
High Pressure Manifold Parts PSL	3	
High Pressure Manifold Parts PR	1	
Area Classification	Non-Hazardous	
Accelerations		
Transverse	≤3.0m/s ²	
Longitudinal	≤3.0m/s ²	
Vertical	≤5.0m/s ²	

Type Approval documentation

[illegible]



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K01201156001AA	1	2"FIG1502 M~2"FIG1502 F Adapter assembly L=200mm
K31101100001AA	1	1"×105MPa~2"FIG1502 Plug valve FM
K01201156049AA	1	2"FIG1502 M~2"FIG1502 F Adapter assembly L=360mm
K51201180001AA	1	2"×105MPa~FIG1502 80 type swivel joint FM
K01201166002AA	1	3"FIG1502 M~2"FIG1502 M Adapter assembly L=200mm
K62201110002AA	1	2"×105MPa~FIG1502 Integral straight pipe FM L=0.5m
K62201120001AA	1	2"×105MPa~FIG1502 Integral straight pipe FM L=1m
K3102002AA	1	1"×105MPa Plug
K3101002AA	1	1"×105MPa Valve body
K0156001AA	1	2"×105MPa Crossover adapter L=200
K0156180AA	1	2"×105MPa Crossover adapter L=360
K5002003AA	1	2"×105MPa-AB Bending joint
K5003006AA	1	2"×105MPa-AD Bending joint
K5006001AA	1	2"×105MPa-BC straight joint
K0166011AA	1	3"×2" Crossover adapter
K6213012AA	1	2"×105MPa straight pipe L=0.5m
K6223002AA	1	2"×105MPa straight pipe L=1m
K43201156001AA	1	TEE ASSEMBLY, 2" FIG. 1502, 105 MPa
K4121004AA	1	WING NUT UNION ASSEMBLY, 2" - 105 MPa
K43201156003AA	1	TEE, INTEGRAL JOINT, 2" FIG. 1502, 105 MPa
K42201156001AA	1	L TYPE JOINT, INTEGRAL JOINT, 2" - 105 MPa
K31201100001AA	1	PLUG VALVE ASSEMBLY, 2" FIG. 1502, 105 MPa
K34201100001AA	1	EMERGENCY SHUT OFF VALVE, 2" FIG. 1502, 105 MPa
K45201156001AA	1	Y-TEE, 2" FIG 1502, 105 MPa

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-	1	Design caculation of 105MPa Integral Joint
-	1	Design calculation of 105MPa plug valve
-	1	Design caculation of 2-105MPa Swivel Joint
-	1	Design caculation of 2-105MPa rigid straight pipe

Fabrication Procedures

Procedures related to fabrication, welding, and NDE shall be reviewed and approved by the local DNV GL Surveyor.

Tests carried out

Type test carried out on 2017-02-09 to unit with Serial Number W1606546.001.

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Marking of product

For traceability, the following marking is to be carried out on each product:

1. Serial Number
2. Manufacturer's name or trademark
3. Additional Marking at the manufacturer's discretion

Certificate Retention Survey

For retention of the Type Approval Certificate, DNV GL's surveyor shall perform a survey every second year in accordance with DNV GL's Class Programme for Type Approval, DNVGL-CP-0338.

Other Comments and Conditions

1. Category I items not named in the drawing section above shall be purchased with a product certificate.
2. Skid frame is reviewed for installation lift only.
3. Scope of certificate does not include flexible cement hoses for discharge.
4. Skid can be used in emergency well kill operations, provided the skid remains in a non-hazardous area. Per DNVGL-OS-E101, Chapter 2, Section 5, Part 7.3.7, facilities for transferring mud to the cementing system shall be provided.
5. HAZLOC Ex documentation (where applicable) shall be submitted to DNV GL surveyor at site. For EX certificates with certificate number that is ending with 'U' or 'X', a document stating compliance with the special conditions given in the certificate shall be presented and demonstrated to local DNV GL Surveyor.
6. The CAT C15 diesel engines, centrifugal pumps, and other Category II items shall be delivered with a works certificate prepared by the manufacturer.
7. Factory Acceptance Testing of the completed skid must be completed and witnessed by a DNV GL surveyor prior to the issuance of a Product Certificate.
8. DNVGL Project Ref. PP162252

END OF CERTIFICATE