DNV·GL

Certificate No:
TAD0000181

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hoisting, Rotation and Pipehandling Equipment

with type designation(s)
Collar Type Elevators - SDS & SDL Side Door

Issued to
Forum B + V Oil Tools GmbH
Hamburg, Germany

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

Application :

See next page.

Issued at **Høvik** on **2020-01-14**
This Certificate is valid until **2025-01-13**.
DNV GL local station: **Hamburg Verification**

Approval Engineer: **Axel Janson**

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.

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Reference Standards

API Spec 8C, "Specification for Drilling and Production Hoisting Equipment (PSL 1 and PSL 2), 5th edition, April 2012.

Product Description

This Type Approval includes a series of elevators listed below. Some of the elevators can be delivered with hydraulic operation as indicated in the table below. This table also shows respective P/Ns for each elevator. Elevators designated with VES have interchangeable bushings for different pipe size ranges, all others are only designed for a certain pipe size range

Application/Limitation

Elevator type	P/N	Load Rating	Size O.D	FEM Appliance Group
SDS 100/1	641020-Y-BC	100 ShT	2.3/8" - 4.1/8"	B3-P3-E3
SDS 100/2	641000-Y-BC	100 ShT	4" - 6.3/4"	B3-P3-E3
SDS 100/3	641040-Y-BC	100 ShT	6.3/4" - 9.5/8"	B3-P3-E3
SDL 150/1	651510-Y-BC	150 ShT	4.3/8" - 8"	B3-P3-E3
SDL 150/1, Hydr.	651510-Y-BC-H	150 ShT	4.3/8" - 8"	B3-P3-E3
SDL 150/2	651520-Y-BC	150 ShT	8" - 11"	B3-P3-E3
SDL 150/2, Hydr.	651520-Y-BC-H	150 ShT	8" - 11"	B3-P3-E3
SDL 150/3	651530-Y-BC	150 ShT	11" - 14"	B3-P3-E3
SDL 150/3, Hydr.	651530-Y-BC-H	150 ShT	11" - 14"	B3-P3-E3
VES-SDL 150/3	651530-Y-VES	150 ShT	8.5/8" - 12.3/4"	B3-P3-E3
VES-SDL 150/3, Hydr.	651530-Y-VES-H	150 ShT	8.5/8" - 12.3/4"	B3-P3-E3
SDS 150/4	641560-Y-BC	150 ShT	13" - 16"	B3-P3-E3
SDL 150/5	651550-Y-BC	150 ShT	18" - 22"	B3-P3-E3
SDL 150/5 Hydr.	651550-Y-BC-H	150 ShT	18" - 22"	B3-P3-E3
SDS 150/7	641620-Y-BC	150 ShT	24" - 30"	B3-P3-E3
SDS 250/0	642600-Y-BC	250 ShT	6.1/2" - 9.5/8"	B3-P3-E3
SDS 250/1	642500-Y-BC	250 ShT	9.5/8" - 13.3/8"	B3-P3-E3
SDS 250/1, Hydr.	642500-Y-BC-H	250 ShT	9.5/8" - 13.3/8"	B3-P3-E3
SDS 250/2	642520-Y-BC	250 ShT	13.3/8" - 18.5/8"	B3-P3-E3
SDS 250/3	642540-Y-BC	250 ShT	18.5/8" - 21.1/2"	B3-P3-E3
SDS 250/3, Hydr.	642540-Y-BC-H	250 ShT	18.5/8" - 21.1/2"	B3-P3-E3
SDS 250/5	642580-Y-BC	250 ShT	24" - 30"	B3-P3-E3
SDS 250/5, Hydr.	642580-Y-BC-H	250 ShT	24" - 30"	B3-P3-E3
SDS 250/6	642620-Y-BC	250 ShT	30" - 36"	B3-P3-E3
SDS 350/1	643500-Y-BC	350 ShT	6.5/8" - 9.3/4"	B3-P3-E3
SDS 350/1, Hydr.	643500-Y-BC-H	350 ShT	6.5/8" - 9.3/4"	B3-P3-E3
SDS 350/2	643520-Y-BC	350 ShT	10.3/4" - 16.3/4"	B3-P3-E3
SDS 350/2, Hydr.	643520-Y-BC-H	350 ShT	10.3/4" - 16.3/4"	B3-P3-E3
SDS 350/4	643560-Y-BC	350 ShT	18.5/8" - 21.1/2"	B3-P3-E3
SDS 350/4, Hydr.	643560-Y-BC-H	350 ShT	18.5/8" - 21.1/2"	B3-P3-E3
SDS 350/5	643580-Y-BC	350 ShT	24" - 30"	B3-P3-E3
SDS 500	645500-Y-BC	500 ShT	10.3/4" - 16"	B3-P2-E2
SDS 500, Hydr.	645500-Y-BC-H	500 ShT	10.3/4" - 16"	B3-P2-E2

Max. Hydraulic Operating Pressure: 210 bar
Minimum design tempearture of above Elevators: -40 °C (-20 °C)

Type Approval Documentation

Tests Carried Out

100 Short Tons SDS 100/3 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 20.01.2010. This test also covers SDS 100/1 and SDS 100/2 according to API Spec 8C Clause 5.2.

150 Short Tons SDL 150/1 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 08.10.2007.

150 Short Tons SDL 150/2 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 26.04.2006.

150 Short Tons SDL 150/3 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 13.04.2007.

150 Short Tons SDS 150/4 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 22.01.2010. This test also covers SDS 150/7 according to API Spec 8C Clause 5.2.

150 Short Tons SDL 150/5 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 22.11.2008.

250 Short Tons SDS 250/2 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 27.03.2010. This test also covers SDS 250/0 and 250/1 according to API Spec 8C Clause 5.2.

250 Short Tons SDS 250/3 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 27.03.2010. This test also covers SDS 250/5 and SDS 250/6 according to API Spec 8C Clause 5.2.

350 Short Tons SDS 350/4 Elevator:
Design verification testing according to API Spec 8C Clause 5.5 is reported in "Test Report Alternative Design Verification Test". Testing was performed 27.03.2010. This test also covers SDS 350/1, SDS 350/2 and SDS 350/5 according to API Spec 8C Clause 5.2.

500 Short Tons SDS 500 Elevator:

Fabrication and Testing Procedures

Test Procedures:

1. Proof load testing of each elevator assembly shall be performed according to API Spec. 8C §8.6. This testing may be carried out without slips installed.

2. Functional testing shall be performed in accordance with DNVGL-OS-E101 Ch.2, Sec.8, §3.

3. Pressure retaining components in hydraulic operated elevators shall be pressure tested 1.5 times max. working pressure in accordance with DNVGL-OS-E101 Ch.2, Sec.8, §3.

4. Charpy Impact testing to be carried out in accordance with API Spec. 8C, Annex A.3 at specified minimum design temperature.

NDE Procedures:

5. NDE/NDT shall be performed in accordance with DNVGL-OS-E101 Ch.2, Sec.8, §3.

Welding Procedures:

6. Qualification of welding procedures and qualification of welders shall be in accordance with DNVGL-OS E101 Ch.2, Sec.8, §3.

Marking of Product

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

- API Spec. 8C
- Manufacturer's name or trade mark
- Relevant PSL number
- Rated load capacity
- Bore size
- Part number
- Serial number
- If inteded for lifting drillpipe, marking shall also be in accordance with API Spec. 8C, §9.8.2.
- Each primary-load-carrying component shall be marked with SR2 and the actual design and test temperature in degrees Celsius, according to Annex A.3 of API Spec. 8C.

Other Conditions and Comments

- Main components shall be delivered with 3.1 material traceability certificates according to EN 10204.
- Loose gear, such as shackles and wires, shall be delivered with pertinent ILO certificates or equivalent.
- The control system of hydraulic controlled elevators is not part of this Type Approval, and shall be approved separately.
- This Certificate replaces Type Approval Certificate D-6042.

Certificate Retention Survey

For retention of this Type Approval Certificate, DNV GL AS's representative shall carry out surveys every second year in accordance with DNV GL Type Approval Scheme DNVGL-CP-0338.

END OF CERTIFICATE