DNV·GL

Certificate No:
TAD0000156

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hoisting, Rotation and Pipehandling Equipment

with type designation(s)
AMP-350/2 Hydraulic Elevator (Frame 2)
AMP-500/1 Hydraulic Elevator (Frame 1)
AMP-500/2 Hydraulic Elevator (Frame 2)
AMP-750/1 Hydraulic Elevator (Frame 1)
AMP-1250/1 Hydraulic Elevator (Frame 1)

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

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018

Application :

See next page.

Issued at **Høvik** on **2019-12-02**
This Certificate is valid until **2024-12-01**.
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

[1] API Spec. 8C, Drilling and Production Hoisting Equipment, 5th Ed., April 2012

[2] F.E.M, Rules for design of hoisting appliances, 3rd Edition 1998

Product Description

The AMP-type elevators are hydraulically operated double door elevators, which are equipped with replaceable bushings to handle various styles and sizes of tubular.

Application/Limitation

AMP-350 Frame 2 Hydraulic Elevator (638200-Y-VC / 638200-Y / 638250-Y)

Design Parameter	Value	Equivalent
Max. Load Rating:	350 sT	3 114 kN
Applicable Pipe Diameter:	9-5/8” – 20”	244 – 508 mm
Max. Working Pressure:	3 046 psi	210 bar
Min. Design Temperature:	-40 °F	-40 °C
FEM Appliance Group:	B3-P3-E3	
Safety Factor Applied:	2.57	
Product Specification Level (PSL):	PSL1	

AMP-500 Frame 1 Hydraulic Elevator (648100-Y / 648100-Y-BV-VC / 648100-Y-VC / 648150-Y)

Design Parameter	Value	Equivalent
Max. Load Rating for 18° Load Shoulder:	500 sT	4 448 kN
Max. Load Rating for 45-90° Load Shoulder:	750 sT	6 672 kN
Applicable Pipe Diameter:	2-3/8” – 11”	60 - 279 mm
Max. Working Pressure:	3 046 psi	210 bar
Min. Design Temperature:	-40 °F	-40 °C
FEM Appliance Group:	B6-P2-E5	
Safety Factor Applied:	2.25	
Product Specification Level (PSL):	PSL1	

AMP-500 Frame 2 Hydraulic Elevator (648250-Y / 648200-Y / 648250-Y)

Design Parameter	Value	Equivalent
Max. Load Rating for 90° Load Shoulder:	500 sT	4 448 kN
Applicable Pipe Diameter:	9-5/8” – 22”	244 - 559 mm
Max. Working Pressure:	3 046 psi	210 bar
Min. Design Temperature:	-40 °F	-40 °C
FEM Appliance Group:	B6-P2-E5	
Safety Factor Applied:	2.25	
Product Specification Level (PSL):	PSL1	

AMP-750/1 Hydraulic Elevator (678100-Y / 678100-Y-BV-VC / 678100-Y-VC / 678150-Y)

Design Parameter	Value	Equivalent
Max. Load Rating for 18° Load Shoulder:	750 sT	6 672 kN
Max. Load Rating for 45-90° Load Shoulder:	1000 sT	8 896 kN
Applicable Pipe Diameter:	2-3/8” – 11”	60 - 279 mm
Max. Working Pressure:	3 046 psi	210 bar
Min. Design Temperature:	-40 °F	-40 °C
FEM Appliance Group:	B6-P2-E5	
Safety Factor Applied:	2.25	
Product Specification Level (PSL):	PSL1	

AMP-1250/1 Frame 1 Elevator (688050-Y)

Design Parameter	Value	Equivalent
Max. Load Rating 18° Load shoulder	1 250 sT	11 124 kN
Max. Load Rating 45° Load shoulder	1 500 sT	13 349 kN
Max. Load Rating 90° Load shoulder	1 500 sT	13 349 kN
Applicable Pipe Diameter:	5-1/2” – 9-7/8”	140 - 251 mm
Max. Working Pressure:	3 046 psi	210 bar
Min. Design Temperature:	-40 °F	-40 °C
FEM Appliance Group:	B5-P2-E4	
Safety Factor Applied:	2.25	
Product Specification Level (PSL):	PSL2	

Type Approval Documentation

Tests Carried Out

Destructive design verification test according API 8C, section 5.5, was carried out 2014-02-25. See *"Test Report – Alternative Design Verification Test AMP-750/1"*.

Design Verification Tests performed on three sizes of the identical design concept (AMP 350, AMP 750 and AMP 1250) qualify the AMP-500/1 elevator without DVT on specific design according to API Specification 8C, Chapter 5.2.

BV AMP-350/2 350 Short Tons Elevator
Design verification testing according to API Spec 8C Clause 5.3 is reported in Test Report Nr.: K 099-2012 – "DMS-Messung waehrend Belastungspruefung". Testing was performed at Institut for Werkstoffkunde und Schweisstechnik,Hamburg University of Applied Sciences". Test report dated 15.02.2012.

1250/1 Automated-Multi-Pipe-Elevator 1250 Short Tons, 18° load shoulder
Design verification testing according to API Spec 8C Clause 5.3 is reported in Test Report for Elevator AMP-1250/1 with 18° load shoulder, P/N 688000-Z , including comparison. Testing was performed at Institut fur Werkstoffkunde und Schweisstechnik, Hamburg University of Applied Sciences". Test report dated 20.06.2013

1250/1 Automated-Multi-Pipe-Elevator 1500 Short Tons, 45° load shoulder
Design verification testing according to API Spec 8C Clause 5.3 is reported in Test Report for Elevator AMP-1250/1 with 45° Load Shoulder, P/N 688000-Z, including comparison. Testing was performed at Institut fur Werkstoffkunde und Schweisstechnik, Hamburg University of Applied Sciences". Test report dated 24.06.2013. This case also covers load case with 90° load shoulder.

AMP 500/2 Hydraulic Elevator
K 483-2015 Design Verification Test Report (Overload Testing), 2015.07.24

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

NDE Procedures:

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

Welding Procedures:

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

Marking of Product

For traceability, the products shall be marked according to API Spec. 8C §10. And shall include:

- Manufacturer's Name or Mark
- Elevator Type
- Reference Standard & PSL number
- Pipe Size Range & Model (when applicable)
- Load Rating
- Part Number
- Serial Number

Other Conditions and Comments

- Materials for the main load-bearing components shall be delivered with 3.1 certificates according to EN10204 or similar.
- Elevator bushings are classified as category II equipment under DNVGL-OS-E101, and they are hence not within the scope of this Type Approval Certificate. Bushing components shall be delivered with appropriate works certificate.
- The control systems are not within the scope of this Type Approval Certificate.
- Each product are to be surveyed during fabrication in accordance with the requirements for equipment of Category I as defined in DNV GL's Offshore Standard DNVGL-OS-E101 Drilling Plant and in accordance with API Spec. 8C, followed by issuance of a DNV GL Product Certificate.
- This Type Approval Certificate replaces certificates D-5788, D-6091 and TAD00000ZE.

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