

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Mud and Cementing Equipment**

with type designation(s)

1.25" to 3" Black Eagle Flexible Hoses for Cementing and Chemical Injection

Issued to

**Parker Hannifin Manufacturing Germany GmbH & Co. KG -
Polyflex Division Europe
Lampertheim, Hessen, Germany**

is found to comply with

DNVGL-OS-E101 – Drilling facilities, Edition January 2018**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL, with exception of vessels where full compliance with API Specification 7K is mandatory.****Product(s) covered in this certificate are: cementing flexible hoses and chemical injection flexible hoses.**Issued at **Høvik** on **2019-02-05**This Certificate is valid until **2021-04-30**.for **DNV GL**DNV GL local station: **Augsburg**Approval Engineer: **Sinisa Sedlan**

.....
Marianne Spæren Marveng
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: **262.1-022365-4**
 Certificate No: **TAD00000CA**
 Revision No: **3**

Reference standard

API Spec 7K, Drilling and Well Servicing Equipment, 6th edition.

Manufacturing location

Hose manufacturer and assembly plant:

- Parker Hannifin Manufacturing Germany GmbH & Co. KG - Polyflex Division Europe
An der Tuchbleiche 4, 68623 Lampertheim (Hüttenfeld), Germany

Hose assembly plants:

- Abdex Industries Pty Ltd, 42 Bushland Ridge, Bibra Lake, WA 6163, Australia
- Beattie Industrial Ltd., Div. of Newfoundland Offshore, 1345 Topsail Road, PO Box 8398, A1B 3N7, Paradise, NF, Canada
- Flexiflo Corp., PO Box 18532, Jebel Ali Free Zone, Dubai, United Arab Emirates
- Fluid Control Service AS, Ljosheimsvegen 1, 4050 Sola, Norway
- Hydrasun Group Ltd., Gateway Business Park, Moss Road, Aberdeen AB12 3GQ, United Kingdom
- Mento AS, PO.Box 44, Kontinentalveien 22, 4098 Tananger, Norway
- Parker Hannifin Corporation, Parflex Division, 11151 Cash Road, Stafford, TX 77477, USA

Product description

Cement and chemical injection hose assemblies including:

- unbonded flexible hose
- end termination
- end connector

Application/Limitation

Structure	Hose nominal size	Max design pressure	Temperature range	Core tube ID (hose ID)	Hose OD	FSL
2440N-20V80	1.25"	10 000 psi	-40/100°C	32.2 mm	55.5 mm	0
2640N-24V80	1.5"	10 000 psi	-40/70°C	38.0 mm	70.5 mm	0
2640N-24V80-15K	1.5"	15 000 psi	-40/70°C	38.0 mm	66.0 mm	0
2240N-32V10	2"	3 000 psi	-40/100°C	50.5 mm	68.5 mm	0
2248N-32V10	2"	5 000 psi	-40/100°C	50.5 mm	68.5 mm	0
2448N-32V80	2"	5 000 psi	-40/70°C	50.5 mm	80.5 mm	0
2449N-32V10	2"	8 000 psi	-40/100°C	50.5 mm	80.5 mm	0
2580N-32V80	2"	10 000 psi	-40/70°C	50.5 mm	84.5 mm	0
2648N-32V80	2"	15 000 psi	-40/70°C	50.5 mm	86.0 mm	0
2240N-48V80	3"	5 000 psi	-40/70°C	75.0 mm	114.0 mm	0
2440N-48V80	3"	10 000 psi	-40/70°C	75.0 mm	122.0 mm	0
2640N-48V80	3"	15 000 psi	-40/70°C	75.0 mm	130.0 mm	0

Job Id: **262.1-022365-4**
Certificate No: **TAD00000CA**
Revision No: **3**

Type Approval documentation

Tests carried out

1. Design verification testing for FSL 0 performed according to Ch. 9.6.10.2, 9.6.10.3, 9.6.10.6 & Ch. 9.6.10.7 in API Spec. 7K 5th edition, for the largest hose with the highest pressure rating in the range covered by this Type Approval (3" 15 000 psi hose 2640N-48V80). Reference is made to SwRI® Report 18.18142.01.330, Rev.1.

Conditions and Comments

1. The hoses covered in this Type Approval are compliant with requirements of DNVGL-OS-E101. Their suitability for service is established by having demonstrated partial compliance with API 7K requirements, with the design intention of API 7K retained.
The hoses are not fully compliant with API 7K in the following:
 - The hoses do not belong to the same design family acc. to definition of family in API 7K
 - Working pressure ratings of 3K and 8K are not specified in API 7K Table 10
 - Working pressure rating of 5K is not intended for cement hoses in API 7K Table 10
 - Hose nominal sizes 1.25" and 1.5" are not specified in API 7K Table 10
 - Temperature ranges of the hoses do not correspond with temperature ranges specified in API 7K clause 9.7.3.1
 - The hoses do not meet the requirement of API 7K 9.7.10.2 for Deformation Test Under Pressure. It is the end user's responsibility to ensure that possible adverse effect of change of length under pressure is considered in the installation.
2. The hoses covered in this Type Approval cannot be used on installations where full compliance with API Specification 7K is required.
3. The end couplings that are NOT according to recognised international standard (such as API 6A or API 16A, etc.), for example, but not limited to, Hammer Lug unions and Grayloc hubs, will need to be in compliance with DNVGL-OS-E101. To demonstrate this, suitability for all internal and external loading shall be proven for each individual hose. Certification of these end couplings shall be according DNVGL-OS-E101:2018 Ch.3 Sec.3 Table 15. This type approval certificate does NOT cover compliance with DNVGL-OS-E101 for NON standard end couplings; this shall be established separately.
4. Hose assembly plants are approved for hose sizes listed in valid "Workshop Certificate", issued by Parker Polyflex

Manufacturing and Testing


1. Assembling of end terminations on hose bodies shall be according to procedures written and maintained by Parker Polyflex Division Europe.
2. Production testing as described in API Spec. 7K shall be followed.
3. DNV GL Product Certificate shall be issued for use on DNV GL class vessel and rigs with notation DRILL, DRILL(N), WELL-1, WELL-2, WELL(N).

Marking of product

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

- All equipment shall be clearly marked with identification and serial number which relates the equipment to certificates and fabrication documentation.
- Markings in accordance with API spec. 7K, 6th ed.

Periodical assessment



Job Id: **262.1-022365-4**
Certificate No: **TAD00000CA**
Revision No: **3**

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.