



DET NORSKE VERITAS

TECHNOLOGY CERTIFICATE

This is to certify that

Parker Phastite Pipe Fittings

are in accordance with DNV-DSS-401 Technology Qualification Management /1/.

DNV considers Parker Phastite qualified for its intended use, as defined in /2/.

This is not a product certificate.

Technology owner: Parker Hannifin Corporation

Name of technology: Phastite Pipe Fitting

Description: Phastite Pipe Fittings are permanent "Mechanically Attached Fittings (MAFs)" that replace the need for welded pipe fittings used in pressure piping systems for onshore, topside and subsea oil and gas hydraulic applications. Phastite fittings are assembled using a specially designed hydraulic press known as "PhasTool".

Application: Interconnecting piping between components such as pumps, valves, motors, accumulators etc. on hydraulic piping systems for subsea controls and marine topsides drilling/production equipment.

Involvement: DNV has been involved in the qualification process as required for Technology Qualification Management acc. to /2/.

Limitations:

Max. Pressure Rating Static/Dynamic*:	10,000/6,000 psi
Min. Temperature:	-40°F
Max. Temperature:	180°F
Max. Water Depth:	15,000 ft
Materials:	22 Cr duplex (collar), 316/316L (body)
Design Life:	25 years
Service:	Non-sour, NACE compliant
Min. Allowable Cathodic Protection:	-1.05 V vs. SCE
Pipe Specifications:	ASTM A312, 3/4", 1", 1-1/2", 2" Sch. 40, 80, 160 and XXH, 304/304L, 316/316L, 317/317L, 321, 347

Fire testing was recommended by DNV, but not included in the qualification plan and not performed.

Qualification is based on the design and material of the tested specimens only. Further limitations given in /3/, /4/, /5/.

*Static pressure rating means 30,000 or less pressure cycles in a life time (dynamic is above 30,000 cycles).

- Reference documents:**
- /1/ DNV-DSS-401, Technology Qualification Management, December, 2012.
 - /2/ DNV-RP-A203, Qualification of New Technology, December, 2012.
 - /3/ Parker Report, Technical Qualification Plan, Ver. 04, April 17, 2013.
 - /4/ DNV Report No. 13UKCGC-8, Technology Qualification Report, Rev.0, July 8, 2013.
 - /5/ Parker Report, Qualification Basis of Parker Phastite Pipe Fittings, Ver. 05, May 25, 2012.

Dublin, July 8, 2013
for Det Norske Veritas (U.S.A.), Inc.

Børresen,
Sven-Erik

Digitally signed by Børresen, Sven-Erik
DN: cn=Børresen, Sven-Erik, o=DNV, email=Sven-Erik.Børresen@dnv.com
Date: 2013.07.07 22:39:23 +05'00'

Sven-Erik Børresen
Senior Engineer

William Kovacs, PE
Project Engineer

This Certificate is valid until
July 8, 2017

Oliver C. Moghissi, Ph.D.
Director, Materials &
Corrosion Technology Center

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