

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings, Bite and Compression Type

with type designation(s)
EO-2 Fittings System, Series L and S

Issued to

Parker Hannifin Manufacturing Germany GmbH & Co KG
Bielefeld, Germany

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV class programme DNV-CP-0185 – Type approval – Mechanical joints

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Temperature range: Refer to certificate
Max. working press.: PN 100
Sizes: 6mm up to 42mm

Issued at **Hamburg** on **2022-12-19**

This Certificate is valid until **2027-12-18**.

for **DNV**

DNV local station: **Hamburg – CMC North/East**

Approval Engineer: **Hagen Markus**

Sven Klinger
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

The EO-2 Fittings System, Series L and S compression fitting system consist of pipe fittings according to DIN 86126 with EO-2 - function nut for the use on CuNiFe pipes.

References:

Parker Hannifin Bulletin 4104-1 /UK – CuNiFe-Corrosion resistant connectors for sea water systems

Component	Materials
Fitting body	CuNiFe1,6Mn 2.1972
EO-2 Functional nut	1.4571
Soft sealing	NBR, FKM
Tubes	CuNi10Fe1,6Mn DIN 86019, WL 2.1972.11

For tubes in addition DNV Ship Rules Pt.4 Ch.6 Section 9, Tables 2 and 3: Minimum Tube wall thickness, and Section 2, Table 3: Material certificates are to be observed.

Scope of fittings

This type approval includes the fittings as specified in the Parker Technical handbook/Catalogue 4100/UK section "DIN fittings".

The following fittings are not included in this type approval certificate:

- Male stud banjo elbow
- High pressure banjo elbow, tee

Production place

Parker Hannifin Manufacturing Germany GmbH & Co KG,
Fluid Connectors Group - High Pressure Connectors Europe,
Schloß Holte-Stukenbrock, Germany

Responsibilities

The certificate Holder Parker Hannifin Manufacturing Germany GmbH & Co KG, BIELEFELD, Germany takes the responsibility that the design and the production of the products is in compliance with the Rules, Standards and/or Regulations listed on page 1 of this certificate.

For the following fitting types limitations as specified in the Rules Pt.4 Ch.6 are to be observed:

Bulkhead and Deck pipe penetrations

Screwed bulkhead fittings are not approved through tank walls, watertight decks and bulkheads.

For application through fire divisions a separate type approval is required.

Straight Bulkhead weld fittings are approved through tank walls, watertight decks and bulkheads.

Through fire divisions the fittings and connected pipe is to be provided with same insulation material as used for the divisions. Total insulation length of 450mm.

Pipe connectors where pressure -tight joints are made on the threads are limited in the application as follows:

Pipe connector design	Range of application ¹	
..with tapered or parallel thread	not approved for toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur	
..with parallel thread	approved for pipe class III	up to outside diameter 60.3mm
..with tapered thread	approved for pipe class I	up to outside diameter 33.7mm
	approved for pipe class II, III	up to outside diameter 60.3mm

Note

¹ Refer to DNV Rules, Pt.4 Ch.6 – Section 9 – 5.2.6.

Overview of threaded pipe fittings with limitations

Type	Name
GE-R(KEG), GE-M(KEG), GE-NPT	Male stud connector
EGE-NPT	Swivel connector
WE-NPT, WE-M(KEG), WE-R(KEG)	Male stud elbow
TE-R(KEG), TE-M(KEG)	Male stud branch tee
LE-R(KEG), LE-M(KEG)	Male stud run tee
GAI-NPT	Female connector
RI-ED, RI	Thread reducer/expander

All other fittings with thread connection not listed in the above table may be used without limitations.

Application/Limitation

The pipe coupling system is type approved for application in pipe class I, II and III-piping systems, fire resistant type, as listed in DNV Ship Rules Pt. 4 Ch. 6, Sec. 9 - Table 9 and 10 / Compression coupling - Bite-type.
Classification and fire endurance: wet.

Pipe fittings are in general not approved for installation in high pressure fuel injection systems of combustion engines.

Size and Pressure range¹

Series	Tube OD	Nominal pressure ² bar
L - series	6mm up to 42mm	PN100
S - series	6mm up to 38mm	

Notes

¹ Individual pressure ratings of the fittings as specified in the Parker Hannifin catalogue are to be observed.

² For service temperatures > 50°C the reduction factors in the Parker Catalogue 4100/UK are to be observed.

Temperature range

Fittings	Temperature range
CuNiFe10Fe1,6Mn	- 55°C up to + 400°C

Sealings	Temperature range
NBR	- 35°C up to + 100°C
FKM	- 25°C up to + 200°C

The service temperature range applicable is according to fitting material and sealing material selected.

In addition, temperature limits with regard to seal durability with hydraulic fluids to be observed.
Reference Parker Technical handbook/Catalogue 4100/UK

Temperature range examples

CuNiFe10Fe1,6Mn pipe fitting with FKM sealing	- 25°C up to +175°C
CuNiFe10Fe1,6Mn with NBR sealing	-35°C up to +100°C

Assembling and Installation

To ensure the performance of the mechanical joint connection the assembly instructions specified in Parker Technical handbook/Catalogue 4100/UK, Section "Tube assembly" are to be observed.

This certificate is valid for tube connection made by fittings and nuts supplied by Parker Hannifin solely.

Type Approval documentation

Type Tests carried out

DNV CP 0185

Tightness test, Repeated assembly test, Burst pressure, Pull-out test, Combined pressure impulse and Vibration test, Vacuum test, Fire resistant test ISO15540:2016 (wet condition).

Marking of product

Component	Example
EO2 Functional nut	
Manufacturer – Material Code - Size	EO 71 42
Tube fitting	
Manufacturer- Material Code	EO C1F

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Section 4.

In addition burst pressure test on selected sizes to be carried out in the course of the renewal survey.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>