



TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000TA
Revision No:
6

This is to certify:

That the Pipe Couplings, Bite and Compression Type

with type designation(s)
EO-D / -DPR / -PSR / EO-2 and EO2-Form

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: -55°C up to +400°C
Max. working press.: 100 bar up to 800 bar
Sizes: 4mm up to 42mm

Issued at **Hamburg** on **2024-02-21**

This Certificate is valid until **2028-07-31**.

DNV local unit: **Magdeburg**

Approval Engineer: **Hagen Markus**

for **DNV**

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 Parker Hannifin “DIN fitting” system, according to DIN 3861 / EN ISO 8434-1, consist of the following components:

Cutting rings

- D - metallic sealing, cutting ring - EO 24° cone end
- DPR - metallic sealing, progressive ring - EO 24° cone end (stainless steel)
- PSR - metallic sealing, progressive stop ring - EO 24° cone end, over-tightening protection (steel)

Nuts

- M - EO nut acc. to DIN 3870/EN ISO 8434-1 (carbon steel, stainless steel, brass)
- FM - EO-2 Functional nut - soft sealing in nut (carbon steel, stainless steel)
- FORM - EO2-FORM Set acc. to DIN 3870/EN ISO 8434-1 - soft sealing metal ring with NBR or FKM seal plus nut (carbon steel, stainless steel)

Sealing

EO-2 soft sealing ring (metal ring with NBR or FKM seal)

Tube fittings

This type approval includes tube fittings as specified in the Parker Technical handbook/Catalogue 4100/UK “Industrial Tube Fittings Europe- Section I2 to I5 DIN fittings”.

Not included are male stud banjo elbow and high-pressure banjo elbow, tee.

For the following tube fittings limitations as specified in the Rules Pt.4, Ch.6 are to be observed:

Bulkhead fittings

Bulkhead coupling types SV and WSV are not approved through tank walls, watertight decks and bulkheads. For application through fire divisions a separate type approval is required.

For penetration through A – class bulkheads and decks (fire divisions), the wall thickness of the connected tube shall be at least 3mm. (Refer to SOLAS Chapter II-2, Regulation 9.3)

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

Materials

The tables below specify the standard types of materials.

Tube fittings	Material type ¹
D	Carbon steel, Stainless steel, Brass
DPR	Stainless steel
PSR	Carbon steel
FM, FORM	Carbon steel, Stainless steel
Tubes	Stainless steel
	Carbon steel
	Copper

Notes

¹ For detailed material designation refer to Parker Hannifin Catalogue 4100-10/UK, Section C Performance data.

Selection of materials

It shall be noted that the selection of the materials considers the applicable service condition with respect to type of media, flow velocity, media temperature and installation area of the piping system.

In particular, the resistance to corrosion, erosion, oxidation and other deterioration during projected service life are to be considered.

Sea water application

The term sea water application includes piping systems conveying sea water and piping systems installed on the open deck.

The stainless-steel materials 1.4571 (AISI 316Ti), 1.4404 (AISI316L) and 1.4401(AISI316) specified are approved for sea water systems, whereas brass materials are not.

Even the stainless-steel grade specified above cannot be considered immune to attack under all situations, avoidance of stagnant seawater conditions and removal of welding oxides after welding are some of the important factors to the successful use in piping systems for sea water and installation on open deck.

References

- DNV Rules Pt.4 Ch.6 – Section 2 – Materials
- Parker Hannifin Catalogue 4100/UK, Section C - Performance data

Tubes

For selection of the tubes the general recommendations in Section S of the Parker Technical Handbook/Catalogue 4100/UK are to be observed.

In addition the following DNV Rules are to be observed

- Pt. 2 Materials and welding – Ch. 2 Metallic material – Section 5 Steel pipes and fittings – Para 2 Pipes for pressure systems
- Pt.4 Ch.6, Section 9, Minimum wall thickness - Tables 2 (carbon steel) and 3 (stainless steel).

Production sites

This certificate includes in addition the following production places:

Parker Hannifin Manufacturing Germany GmbH & Co KG, Am Metallwerk 9, 33659 Bielefeld, Germany

Parker Hannifin Sp.z.o.o. ul, Eugeniusza Kwiatkowskiego 16, PL- 55011 Siechnice, Poland

Parker Hannifin Manufacturing Germany GmbH & Co KG, Am Bahndamm 35, 33758 Schloss Holte-Stukenbrock

Parker Hannifin Fluid Connectors (Qingdao) Co. Ltd., NO 9 of Chongshen Road, Qingdao National high-tech. Industrial development zone Qingdao, China

Responsibility

Parker Hannifin Manufacturing Germany GmbH & Co. KG takes the responsibility for the design and the production procedures with relation to ensuring continued consistent production of the type approved products.

Reference DNV CP-0338 Type approval scheme, Section 4.

Application/Limitation

The Parker Hannifin “DIN” fitting systems EO-D / -DPR / -PSR / EO-2 and EO2-Form connector systems are type approved for application in pressurized piping systems of pipe class I, II and III piping systems.

The connectors are classified as “Compression couplings, Bite type” according to DNV Ship Rules Pt. 4 Ch. 6, Sec. 9 - Table 8 Examples of mechanical joints .

Range of application according to Table 9 Application of mechanical joints. Connectors with elastomeric seals are approved for application according to “Fire endurance test condition 30min wet” or “fire endurance test not required.” Appropriate footnotes – Fire resistance capability of table 9 are to be observed.

The connector systems are not approved for application in high pressure fuel injection systems of combustion engines.

Sizes and nominal pressure range (PN)

The nominal pressures specified in the table are in general approved for straight tube fittings and nuts. For form tube fittings such as elbows and t-pieces, reduced pressures according to Parker “Technical Handbook/Catalogue 4100/UK Industrial Tube Fittings Europe – Section I may have to be observed.

Tube fitting component	Size range (mm)	Series	Nominal pressure PN (bar)		
			Stainless Steel	Carbon steel	Brass
D	04, 06, 08, 10, 12	LL	100	100	63
	06, 08, 10, 12, 15, 18	L	n.a.	n.a.	200
	22, 28, 35, 42	L			100
	06, 08, 10, 12, 14	S			400
	16,20, 25, 30	S			250
	38	S			200
PSR	06, 08, 10	L			n.a.
	12, 15, 18	L	400		
	22, 28, 35, 42	L	250		
	06, 08, 10	S	800		
	12, 14, 16	S	630		
	20, 25, 30, 38	S	420		
DPR	06, 08, 10, 12, 15, 18	L	315	n.a.	n.a.
	22, 28, 35, 42	L	160		
	06, 08, 10, 12, 14	S	630		
	16, 20, 25, 30	S	400		
	38	S	315		
FM – EO-2 Functional nut	04	LL	n.a.	100	n.a.
	04, 06	LL	100	n.a.	
FM – EO-2 Functional nut EO2-FORM Set	06, 08, 10	L	n.a.	500	n.a.
	12, 15, 18	L		400	
	22, 28, 35, 42	L		250	
	06, 08, 10	S		800	
	12, 14, 16	S		630	
	20, 25, 30, 38	S		420	
FM – EO-2 Functional nut	06, 08, 10,12, 15, 18	L	315	n.a.	n.a.
	22, 28, 35, 42	L	160		
	06, 08, 10, 12, 14,	S	630		
	16, 20, 25, 30	S	400		
	38	S	315		
EO2-FORM Set	06, 08, 10	L	500	n.a.	n.a.
	12, 15, 18	L	400		
	22, 28, 35, 42	L	250		
	06, 08, 10, 12	S	630		
	14, 16	S	530		
	20, 25, 30, 38	S	420		

Temperature range

The temperature range is limited by the soft sealing material applicable.

Refer to Parker "Technical Handbook/Catalogue 4100/UK Industrial Tube Fittings Europe, Section C2 Performance data".

Material	Temperature range
Steel	-20°C ¹ up to +250°C
Stainless steel	-55°C up to +400°C
Brass	-55°C up to +175°C

NBR	-35°C / -40°C ² up to +100°C / +120°C ²
FKM	-25°C / -35°C ² up to +200°C

Notes

¹ Lowest medium temperature. Lowest environmental temperature -40°C. Reference DIN 3859-1 Compression couplings Part 1 Technical delivery conditions
² Permitted ambient temperature.

Temperature range examples

Tube fittings made of steel with NBR sealing	Media: -20°C up to +100°C Ambient: -40°C up to +120°C
Tube fittings made of stainless steel with FKM sealing	Media: -25°C up to +200°C Ambient: -35°C up to +200°C

For application at elevated temperatures the pressure reduction factors specified in the "Parker Technical Handbook/Catalogue 4100/UK Industrial Tube Fittings Europe, Section C2 Performance data" are to be observed.

Type Approval documentation

Tests carried out

DNV CP-0185

Repeated Assembly Test, Tightness test, Burst Pressure Test, Pull-out test, Vacuum test, Combined Impulse and Vibration Test, Fire resistance tests (wet condition).

Assembling and Installation

For assembly and installation of the fittings the General safety and Assembly instructions specified in the Parker Hannifin catalogue C 4100-10/UK, Section E Tube assembly" are to be observed.

Tube connections/assembly are to be made by using tube fittings manufactured by Parker Hannifin solely.

Marking of product

Component	Example
Coupling	Parker, identification sign of manufacturer
Nut	EO/P on nut size
Cutting ring steel	EO-PSR
Cutting ring stainless steel	EO 71 dpr

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, Sec.4.

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

End of certificate