

TYPE APPROVAL CERTIFICATE

Certificate No:

TAPO0000TA

Revision No:

2**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 GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range: -55 °C up to +400°C (refer to certificate)****Max. working press.: 100 bar up to 800 bar (refer to certificate)****Sizes: 4 mm up to 42 mm**Issued at **Hamburg** on **2017-10-20**This Certificate is valid until **2022-10-17**.DNV GL local station: **Magdeburg**Approval Engineer: **Hagen Markus**for **DNV GL**

Digitally Signed By: Drews, Olaf

Location: DNVGL Hamburg

Signing Date: 2017-10-20

Olaf Drews**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: **262.1-022084-1**
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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, progressive 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

FM - EO-2 Functional nut - soft sealing in nut (steel + stainless steel)
FORM - EO2-FORM Set - soft sealing metal ring with NBR or FKM cover plus nut (steel + stainless steel)
Manufactured in accordance with DIN 3870/EN ISO 8434-1

Sealing

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

Fittings

This type approval includes the fittings as specified in the Parker catalogue no 4100-10/UK, section I2 to I5 'DIN fittings'.

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

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

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

- **Bulkhead connections** of type SV, WSV are not approved through tank walls, fire divisions, watertight deck and bulkheads.
- **Pipe couplings with threaded sealing connections** are limited in the application as follows:
Pipe couplings with parallel thread are not approved for pipe class I and II.
Tapered or parallel thread is not approved for toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
Refer to DNVGL Rules, Pt.4, Ch.6 – Section 9 – 5.2.6.

Overview of threaded pipe couplings with limitations

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

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Materials

Component	Material designation
D	Brass
DPR	Stainless steel
PSR	Carbon steel
FM, FORM	Stainless steel
	Carbon steel
Fittings	Stainless steel
	Carbon steel
Tubes ¹	Stainless steel
	Carbon steel
Sealing	Metal ring with NBR or FKM cover

For detailed material designation refer to Parker Catalogue no 4100-10/UK, Performance data

Notes

¹ For selection of the tube wall thickness the DNV GL Ship Rules Pt.4, Ch.6, Section 9, Tables 3 and 4 are to be observed. Requirements on material certificates are defined in Section 2, Table 3.
Tubing of correct temper and tolerances as recommended by the manufacturer shall be used.

Production places

This certificate includes in addition the following production places:

Parker Hannifin Sp.z.o.o. Ul. Eugeniusza Kwiatkowskiego 16 PL- 55011 Siechnice Poland	Parker Hannifin Fluid Connectors (Qingdao) Co. Ltd. East of Huojo branch road, South of Xinye road, Qingdao National high-tech. Industrial development zone Qingdao China
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Responsibility

The company Parker Hannifin Manufacturing Germany GmbH & Co. KG takes the responsibility that both design and production are in compliance with the DNV GL Rules and Class Programme listed on page 1 of this certificate.

Application/Limitation

The Parker Hannifin "DIN" fitting systems EO-D / -DPR / -PSR / EO-2 and EO2-Form are type approved for application in pipe class I, II and III-piping systems, as specified in DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 12 and 13 - compression couplings - fire resistant type.

Sea water piping systems

For application in sea water systems stainless steel grades with a minimum pitting resistance equivalent number (PREN) of 30 shall be used.

Refer to Parker Hannifin catalogue C 4100-10/UK, Section C – Materials and Parker overview "List of Grades". With respect to DNVGL Rules refer to Pt.4, Ch. 6 – Section 2 Materials.

Assembling and Installation

Pipe Couplings, Bite and Compression Type are not approved for installation in high pressure fuel injection systems of combustion engines.

For assembly and installation of the pipe couplings the Parker Hannifin catalogue C 4100-10/UK, Section Tube and Fitting assembly are to be observed.

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Temperature range for fittings with metallic sealing

Carbon steel: -20¹°C up to 300°C
Stainless steel: -55°C up to 400°C
Brass: -55°C up to 200°C

For application at elevated temperatures the pressure reduction factors as specified in the "Parker Hannifin catalogue 4100-10/UK", Section C2 are to be observed.

Temperature range for fittings with soft sealing

NBR: -35°C up to 100²°C
FKM: -25°C up to 200°C

The applicable temperature range for fittings with soft seals depend on the type of sealing material.

Examples

Stainless steel pipe fitting with NBR sealing: - 35°C up to 100°C
Carbon steel pipe coupling with FKM sealing: - 20°C up to 200°C

Notes

¹ Lowest medium temperature -20°C and lowest environmental temperature -40°C. Refer to DIN 3859-1.

² Refer to "Parker Hannifin catalogue 4100-10/UK", Section C2.

Marking of product

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

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Sizes and pressure range^{1,2}

Fitting component acc. to Parker catalogue I2	Size range (mm)	Series	Stainless Steel bar	Carbon steel bar	Brass bar
D	04, 06, 08, 10, 12	LL	100*	100*	63
	06, 08, 10, 12, 15, 18	L	-	-	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	-	500	-
	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	-	-
	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	-	100	-
	04, 06	LL	100	-	-
FM – EO-2 Functional nut EO2-FORM Set	06, 08, 10	L	-	500	-
	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	-	-
	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		
	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		

Notes

¹ Individual nominal pressures of the fittings accordance to catalogue 4100-10/UK has to be observed.

² Max working pressure depend on pipe material and thickness



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Type Approval documentation

Tests carried out

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Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.

The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking
- witness of burst testing on selected sizes from production.

Periodical assessment is to be performed after 2 years and after 3.5 years.

A renewal assessment will be performed at renewal of the certificate.

In connection with the renewal assessment, burst pressure tests on test assemblies are to be carried out in the presence of the DNV GL surveyor. The test assemblies shall consist of two pieces of tubing connected with a mechanical joint of straight type. Selection of joint sizes and quantity of test assemblies is to be determined prior to the assessment.

At least one of the test assemblies is to be manufactured in the presence of the surveyor according to the manufacturers specification.