

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Pipe Couplings with Bolts Not Covered by a National Standard**with type designation(s)
Parflange® F37 flanged connector system

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
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****Application :****Products approved by this certificate are accepted for installation on all vessels classed by
DNV GL****Temperature range: -40°C up to +200°C. Refer to certificate.****Max. working press.: Up to 420 bar. Refer to certificate.****Sizes: 1/2" up to 10".**Issued at **Hamburg** on **2018-04-25**This Certificate is valid until **2023-04-24**.for **DNV GL**DNV GL local station: **Magdeburg**Approval Engineer: **Hagen Markus**.....
**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: **262.1-022086-1**
Certificate No: **TAP00000TD**
Revision No: **1**

Product description

The Parker Hannifin Parflange® F37 flanged connector system is utilising orbital tube forming technology. Tube wall thickness up to 9mm and pressure ratings up to 420bar.

Corrosion protection of carbon steel flanges, tubes and accessories by Cr(VI) - free corrosion protection system.

The following connection methods are applicable:

- Tube-to-tube connection consisting of:
 - two or one inserts and two flanges acc. to ISO 6162-1, ISO 6162-2 and ISO 6164 (special round design for sizes above 4").
 - one or two inserts (one insert with O-Ring nut one with flat surface), inserts soft sealed by O-Rings to the pipe end and to each other by F37 Seal (optionally Bonded Seal or O-Ring).
- Tube-to-port connection consisting of:
 - One flange ISO 6162-1, ISO 6162-2, ISO 6164 (special round design for sizes above 4").
 - One insert one O-Ring to pipe end and sealed by F37 seal (optionally Bonded Seal or O-Ring) to the port.

This type approval includes the components as specified in Parker Hannifin Catalogue 4162.

The following components are not included:

- Ball valves and non-return valves
- Retaining ring hose couplings
- Tube clamps

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

Bulkhead penetration of type VB – Vibra bulkhead is not approved through tank walls. For application through fire divisions, watertight deck and bulkheads a separate type approval is required.

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

- Pipe connectors 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 pipe connectors with limitations

Type	Designation
MTF-N	Male thread adapter, NPT

All other fittings with male stud end not listed in the above table are approved and not limited in the application.

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Materials

The tables below specify the standard types of materials.

For detailed material designation refer to Parker Hannifin Catalogue 4162, Section "Technical Data".

Component	Materials
Flanges, Inserts, Sleeves	Carbon steel
	Stainless steel ³
Tubes ^{1,2}	Carbon steel
	Stainless steel ³
Bolts	Carbon steel Class 8.8 or 10.9
	Stainless steel A4, Class 80

Sealings	
Types	Materials
F37 Seal	PUR
BS – Bonded seal	Steel or stainless steel ring with NBR or FKM cover
O-Ring	NBR, FKM

It is the manufacturer's responsibility to ensure that the materials applied for the manufacturing of the products are suitable for the intended installation area and service conditions applicable.

Notes

¹ For selection of the tubes refer to Parker Catalogue no 4162, Section "Pipes and tubes".

² Tube wall thickness calculation acc. to DNV GL Ship Rules Pt.4, Ch.6, Section 9 – 1 Pipes.
Material certificates acc. to Section 2, Table 3.

³ For application in sea water systems and unprotected installation against green sea on open deck stainless steel grades with a minimum pitting resistance equivalent number (PREN) of > 33 shall be used. Reference is made to Parker Hannifin overview "List of material grades".

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 Co. Ltd. No. 1 Shangma Duan, Aodong RD, Chengyang, Qingdao Shandong, China
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Responsibility

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.

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Application/Limitation

The Parflange® F37 flanged connector system is type approved for application in pipe class I, II and III piping systems. Refer to DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 12 and 13 - Compression couplings - Fire resistant type.
 The system is not approved for application in high pressure fuel injection systems of combustion engines.

For installation on Offshore units the requirements specified in the applicable DNV GL rules for classification of Offshore units (RU-OU) are to be observed.

Selection of materials

It shall be noted that the selection of the materials considers the intended service condition and installation area of the piping system. In particular, the resistance to corrosion, erosion, oxidation and other deterioration during intended service life.

Reference is made to DNVGL Rules Pt.4, Ch.6 – Section 2 – Materials.

Sizes and Maximum allowable pressures (M.A.W.P.)^{1,2}

SAE 1000 PSI			SAE 3000 PSI		
Type	Size	M.A.W.P. bar	Type	Size	M.A.W.P. bar
F37-124	1 ½"	70	F37-308	½"	350
F37-132	2"		F37-312	¾"	350
F37-140	2 ½"		F37-316	1"	350
F37-148	3"		F37-320	1 ¼"	280
F37-156	3 ½"		F37-324	1 ½"	280
F37-164	4"		F37-332	2"	280
F37-180	5"	50	F37-340	2 ½"	210
F37-196	6"		F37-348	3"	210
F37-1128	8"				
F37-1160	10"				

SAE 6000 PSI			DIN ISO 6164		
Type	Size	M.A.W.P. bar	Type	Size	M.A.W.P. bar
F37-608	½"	420	F37-432	2"	400
F37-612	¾"	420	F37-440	2 ½"	400
F37-616	1"	420	F37-448	3"	400
F37-620	1 ¼"	420			
F37-624	1 ½"	420			
F37-632	2"	420			

Notes

¹ Individual nominal pressures of the flanges acc. to catalogue 4162 are to be observed.

² Max working pressure depend on pipe material and thickness.

Pressure reduction of permissible operating temperatures as specified in the Parker catalogue 4162 – Section "Technical Data".

Job Id: **262.1-022086-1**
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Temperature range²

The temperature range for the Parflange® flanged connector system is limited by the soft sealing material applicable.

Material	Minimum allowable Temperature	Maximum allowable Temperature
Steel	- 40°C	+ 200°C
Stainless steel	- 55°C	+ 400°C
NBR	-35°C / -40°C ¹	+ 100°C / +120°C ¹
FKM	-25°C / -35°C ¹	+ 200°C ¹
PUR	-35°C	+ 100°C / +120°C ¹

Notes

¹ Ambient temperature of hydraulic and pneumatic applications.

² Refer to "Parker Hannifin catalogue 4162, Section "Technical data".

Assembling and Installation

Orbital tube forming is to be made by using Parker Flaring Machines as specified in catalogue 4162, Section Machines, tooling and equipment.

For installation of the F37 Flange system Parker catalogue 4162, Section Installation is to be observed.

Type Approval documentation

Tests carried out

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Marking of product

For traceability to this type approval the individual components delivered by Parker are to be marked at least with:

Component	Marking/Identification criteria
Flange, Inserts, Sleeves	Parker identification sign, size and type
F37 Seal	Ring with flat shape Colour: green
Bonded seal	Outer metal ring with soft seal NBR: black FKM: green
O-Ring	NBR: black FKM: green
Bolts	Material/Strength class Steel: e.g. 8.8 Stainless steel: A4-80

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.

End of certificate