Parflange® F37

Parker

Parflange F37 non-welded flange system

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Date

Parflange
F37
non-welded flange system

Parflange® F37

Non-Welded Seamless Piping Connection System

Designed for low-to-high pressure tube / pipe connection

- **Pressure range 50 - 420 bar *Tube OD. up to 273mm (10“) *½ to 10“ flanges**

Ideal replacement for welded piping systems in marine, shipbuilding, industrial & offshore

Steel and stainless steel products

Interchangeable with proven industry systems

Parflange® F37

Huge Total Cost Reduction Compared to Welding

Vs Welding, Parflange® F37 time and cost benefits:

- Wide product range enables flexible planning and engineering
- 5x quicker end connection process
- 6 – 8x faster prefabrication time vs onsite fabrication
- No problems with availability of experienced welders
- No X-ray necessary
- No post-welding cleaning costs
- Reduced flushing costs (30mins vs welded 4hrs average)
- No ‘Hot Work’ needed

Value Calculator vs Welding

Parflange F37 - Calculating your Value !!

Time Saving Calculation	Welding	F37
Cut and deburr tube [min]	3	3
Tube preparation for welding [min]	2	0
Prepare equipment / Work area [min]	3	2
Welding / assembly time [min]	40	5
Inspect and test (x-ray) [min]	0	0
Tube cleaning [min]	5	1
Total time per connection [min]	53	11
Time Saving F37 per connection in min	**42**	
Number of welded connections per unit	1	
Number of produced units per year	3,000	
Number of welded connections per year	**3,000**	
Hourly labour cost	50 €	
Labour cost per connection	44 €	9 €

F37 Installation Savings compared to Welded Systems	
Installation time saved per unit [hrs]	1
Installation time saved per year [hrs]	2,100
Installation labour cost saved per system	35 €
Installation labour cost saved per year	**105,000 €**

Parflange F37
non-welded flange system

Standard and Weld Flange Program

- Full range of ‚standard flanges‘ according to international and market standards:
  - ISO 6162-1/2
  - ISO 6164
  - CETOP
  - Gear Pump Flanges
- Flange adapters EO® 24°, BSPP 60°, NPT, UNF, O-Lok®, Triple-Lok®…
- Accessories

Parflange® F37

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Parflange F37 non-welded flange system

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Hydraulics in changing Times

From Connection Technology to Systems Supplier

SAE Flanges (Weld-Flanges)

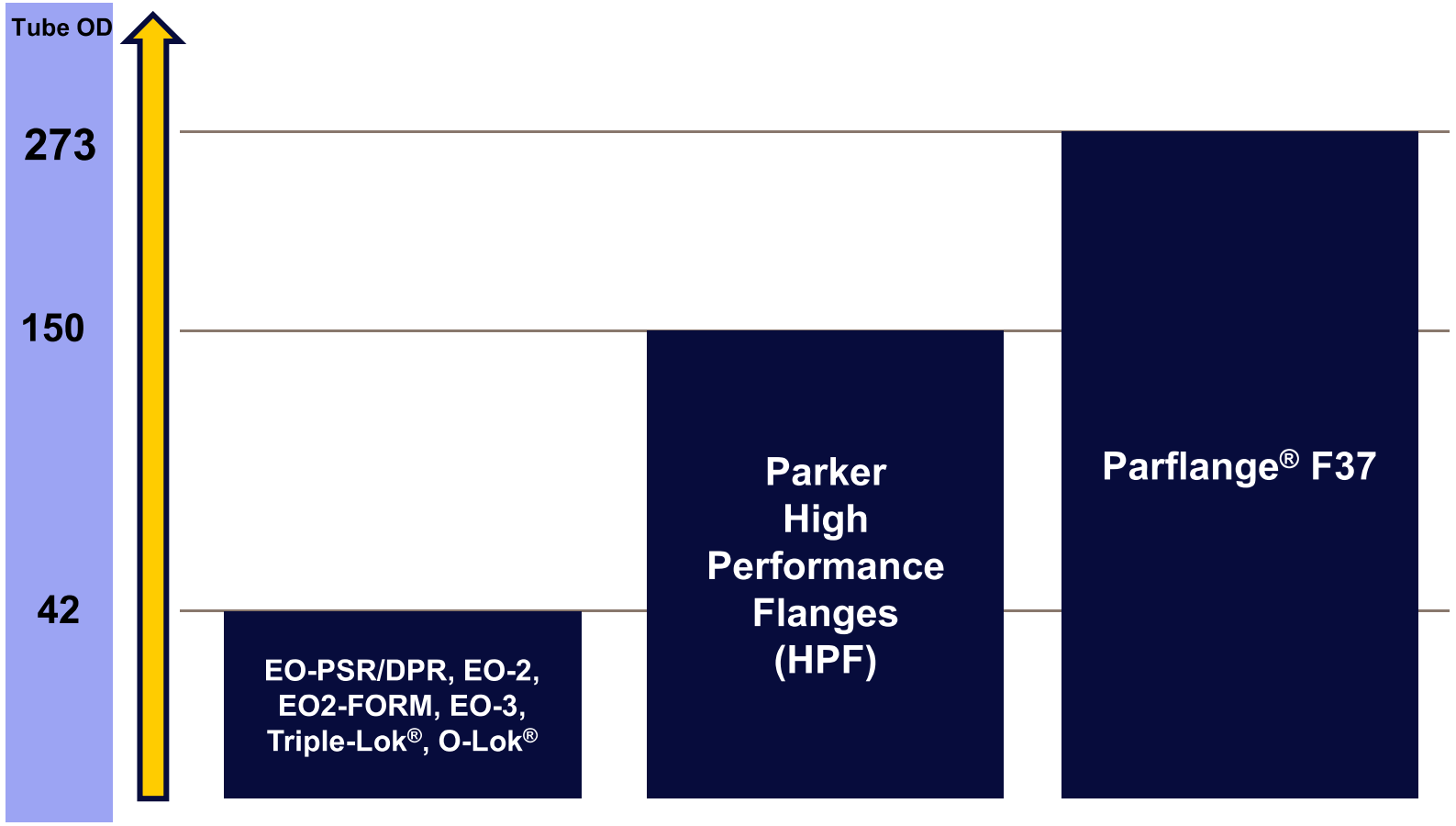
2007

F37 / HPF (Non-welded Flanges)

Parflange® F37

- Non-welded seamless piping connection system
- Designed for low-to-high pressure tube connection
  - Pressure range 0 - 420 bar
  - Tube OD. up to 273 mm (10“)
  - ½ to 10“ flanges
- Ideal for replacement of welded piping systems in marine, shipbuilding and offshore
- Steel and stainless steel products
- Interchangeable with proven industry systems
- Type approved by DNV, ABS and other certification society

TFDE Non Welding Connection Technology



Non-Welded Pipe Connections

The Potential for your Profit

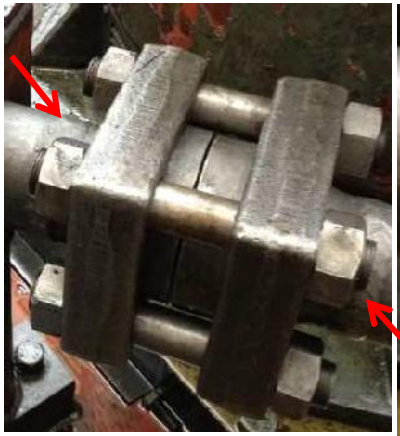
Conventionally Welded Connection

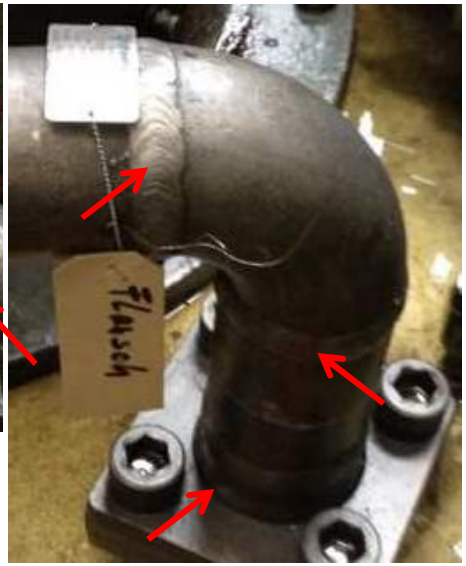
Cutting | Bevelling | Cleaning | Welding | Abrasion | Etching | X-Ray (Check) | Painting | Installation

Parflange® F37 Non-Welded Connection

Cutting | Tube Forming | Installation

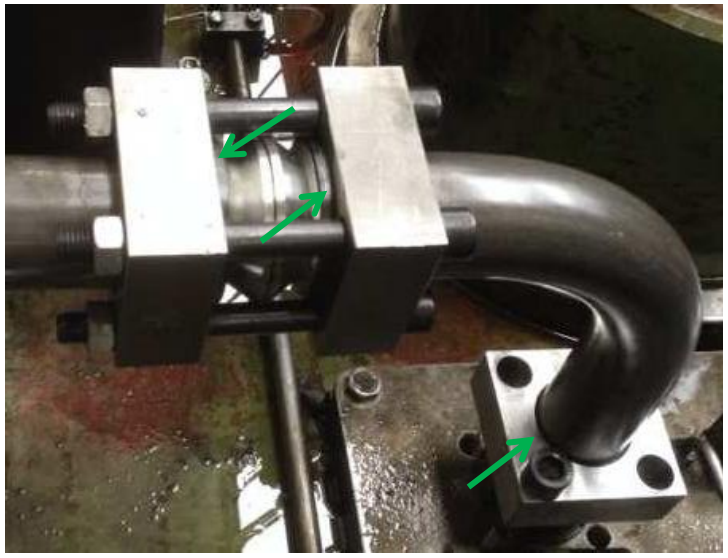
Piping Technology Comparison Example





5 x welding
appr. 750 min

3 x forming
appr. 15 min



Parflange® F37

Huge Total Cost Reduction Compared to Welding

Compared to conventional welding, Parflange® F37 leads to several time and cost benefits:

- **Wide product range and ISO conformity enable flexible planning and engineering**
- **Parflange® process for faster pipework fabrication**
- **Shorter prefabrication time leading to faster total installation time**
- **No problems with availability of experienced welders**
- **No X-ray necessary**
- **No post-welding cleaning costs**
- **Reduced flushing costs**
- **No “hot work” permit required**

All leading to reduced total project time and costs!

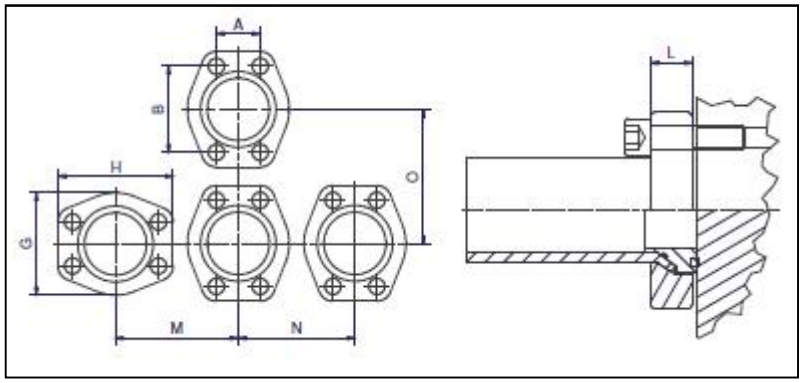
Parflange® F37
Huge Total Cost Reduction

Feature	Customer Value
No welding	- Reduced preparation time per joint
	- No costly inspection of welds (X-ray)
No post-weld cleaning	- No acid cleaning costs
	- No waste cleaning costs
	- No safety risk
	- Environmentally friendly
No welding stress corrosion possible	- Maximum piping lifetime
	- Reduced maintenance costs
No „hot work“ permit required	- Operation can take place in areas with fire risk without interruption of production
	- Reduced downtime costs
	- Higher level of safety
Work shop prefabrication	- High quality joints with better accuracy due to workshop conditions
	- Minimized need for on-site work
	- Shorter installation time
	- Shorter maintenance/downtime
	- Shorter total project time
Cleanliness	- Minimized need for repair and replacement of hydraulic system components such as pumps, cylinders,…
	- Reduced overall flushing time and costs
Easy dismantling and reassembling	- Quicker, easier and more flexible installation
	- Reduced downtime costs for maintenance and repair

Parflange® F37 - Standards

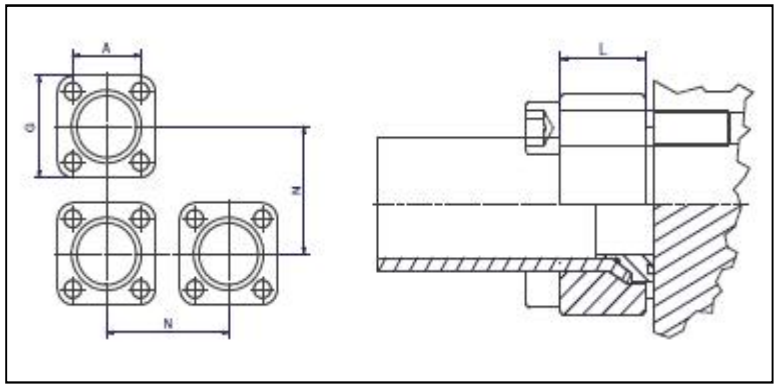
The Parflange® F37 product is fully compatible to flange connections with footprints according to the standards below. All F37 flange components can be connected to hydraulic pumps, motors, cylinders etc. with these related footprints.

ISO 6162-1 / SAE J518 Code 61 (SAE 1000)
ISO 6162-1 / SAE J518 Code 61 (SAE 3000)
ISO 6162-2 / SAE J518 Code 62 (SAE 6000)



DIN ISO 6162-1/-2 Footprint

ISO 6164



ISO 6164 Footprint

Parflange® F37 - Standards

Two Core Non-Welded Piping Technologies

Parflange® F37 Flaring System

Parflange® F37 Retaining Ring System

Standard tube sizes and working pressure: Flaring System

1.000 psi System (ISO 6162-1/2) Flaring System

WP	Flange
70 bar	1 ½ "
	2 "
	2 ½ "
	3 "
	3 ½"
	4 "
50 bar	5 "
50 bar *	6 "
	8 "
	10 "

ISO 6162-1, 3.000 psi Flaring System

WP	Flange
350 bar	½"
	¾"
	1"
280 bar	1 ¼"
	1 ½"
	2 "
210 bar	2 ½"
	3 "

ISO 6162-2, 6.000 psi Flaring System

WP	Flange
420 bar	½"
	¾"
	1"
	1 ¼"
	1 ½"
	2 "

ISO 6164 Flaring System

WP	Flange
400 bar	2 "
	2 ½"
	3 "

All pressure ratings are referred to as WP of the flange.
Pressure ratings of tubes have to be considered seperately.
* Round flange design

Standard tube sizes and working pressure: Retaining Ring System

1.000 psi System (ISO 6162-1/2) Retaining Ring System

WP	Flange
70 bar	1 ½ "
	2 "
	2 ½ "
	3 "
	3 ½"
	4 "
50 bar	5 "
50 bar *	6 "
	8 "
	10 "

ISO 6162-1, 3.000 psi Retaining Ring System

WP	Flange
350 bar	½"
	¾"
	1"
280 bar	1 ¼"
	1 ½"
	2 "
210 bar	2 ½"
	3 "

ISO 6162-2, 6.000 psi Retaining Ring System

WP	Flange
420 bar	½"
	¾"
	1"
	1 ¼"
	1 ½"
	2 "
	2 ½ "
	3 "

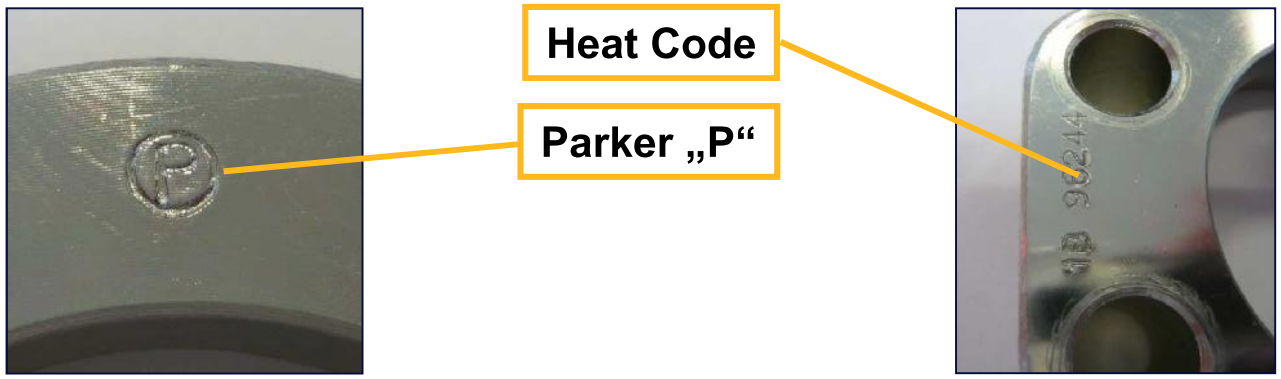
ISO 6164 Retaining Ring System

WP	Flange
400 bar	2 "
	2 ½ "
	3 "
	4 "
	4 ½ "
	5 "
350 bar*	6 "
250 bar*	8 "
	10 "

All pressure ratings are referred to as WP of the flange.
Pressure ratings of tubes have to be considered seperately.
* Round flange design

Parflange® F37
Heat Code Traceability

- All steel and stainless steel parts of the F37 product range are stamped with the heat code
- Traceability to the materials used is possible
- However, if the customer requires a 3.1 certificate this needs to be ordered with the part at small extra cost



Test assemblies and description
IACS Req. 2001/Rev.3 2012 – P2.11

	Test description
Tightness test	1,5 times DP for 5 min. (water)
Vibration (fatigue) test[1)]	bending stress: 25% min. yield strength of the tube vibration cycles: 10^7 vibration frequency: 20 – 50 Hz
Pressure pulsation test[1)]	150% DP (waveform shown in Figure 3) (oil) impulse cycles: $5x10^5$ impulse frequency: 30 – 100 cycles per minute
Burst pressure test	4 times DP pressure for 5 min. (water)
Pull-out test	DP (oil or water) external axial load: $L = \frac{\pi}{4} \times D^2 \times DP$
Fire endurance test	Temperature of flame during test: 800°C ± 50°C Temperature of flowing water point a: 80°C ± 2°C Temperature of flowing water point b: max. 85°C at the end of flame application shall be subjected pressure test 2 times DP for 5 min. (water)
Vacuum test	test specimen is to be connected to the tube
Repeated assembly test	10 times in accordance with manufacturers instruction and then subject to a tightness test as defined in clause P2.11.5.5.1

DP = Design Pressure = nominal pressure

[1)] vibration (fatigue) test and pressure pulsation test are to be carried out simultaneously

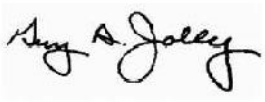
Approvals

- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- China Classification Society (CCS)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Korean Register of Shipping (KR)
- Lloyd´s Register (LR)
- ASME B31.1 / B31.3

ASME B31.1 / B31.3

- Parker Products F37 Range, Triple Lok, O-Lok and CPS cold Bending are compliant to ASME B31.1 / B31.3

I, the undersigned, competent in the applicable field of ASME B31 Code design requirements and using the 2014 Edition of ASME B31.1, *Power Piping*, and 2012 Edition of ASME B31.3, *Process Piping*, do hereby certify that to the best of my knowledge and belief, the data in this Parker Report #13392, dated 11/24/14 for the Parker TFD/TFDE Carbon and Stainless Steel F37 Products meets the qualification requirements of 104.7.2 of ASME B31.1, Section 118 relative to Sleeved Coupled and Other Proprietary Joints and meets the qualification requirements of 304.7.2 of ASME B31.3, Section 318 relative to Special Joints. Based on the data in this report the Parker TFD/TFDE Carbon and Stainless Steel F37 Products should be acceptable for installation in ASME B31.1 and B31.3 piping/tubing systems within the size, pressure and temperature limits noted in this report.



Certified by: _____

Registration No.: 10416 State: Kentucky

Date: 12/2/14

Parflange® F37
Flaring System

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Parflang F37 non-welded flange syste

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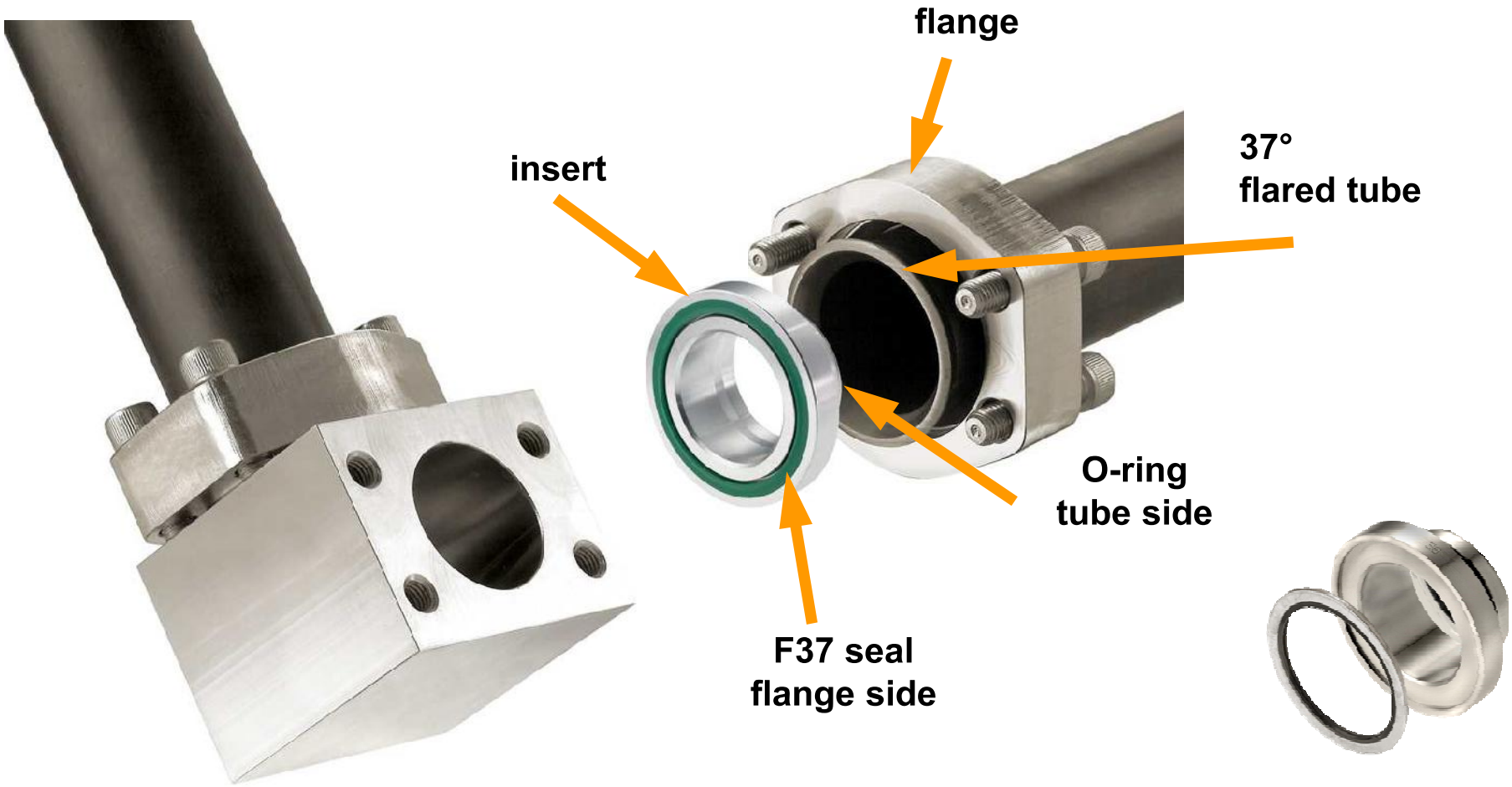
Parflange® F37

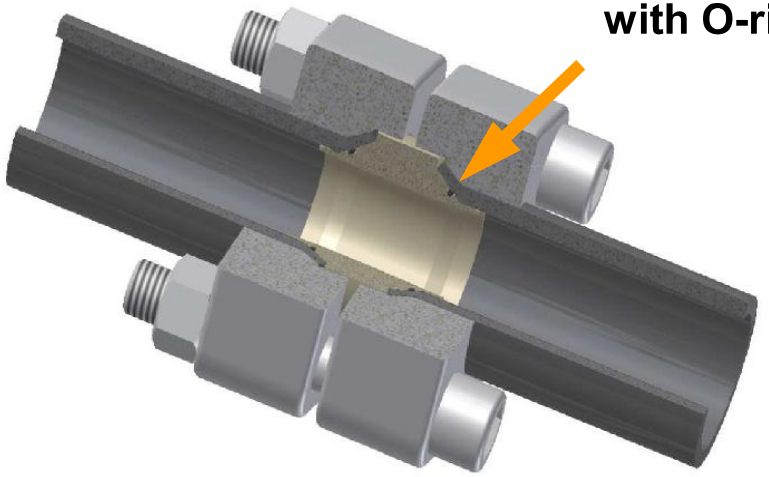
Tube-to-Port Connection

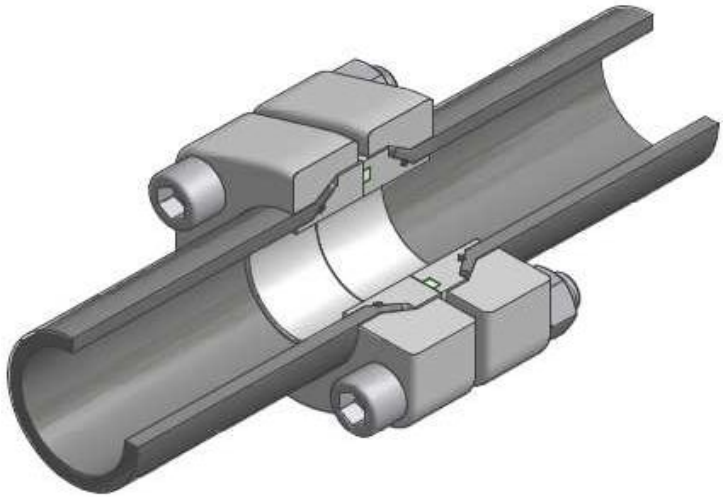


F37 Flaring System

- Tube end is flared orbitally to 37°
- Insert located in each pipe end (tube to tube connection)
- After tightening the flanges‘ srews a high pressure tube connection has been created
- Different F37 connection options available (F37-seal, flat…)

Only 1 insert
with O-rings





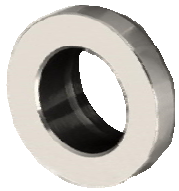
F37 Inserts

TFV	Tube to port Connection, F37-Seal / OR
TFB	Tube to port Connection, Bonded Seal
TT	Tube to tube Connection, 1-piece
TF	Tube to flange Connection, flat surface

Seal Materials

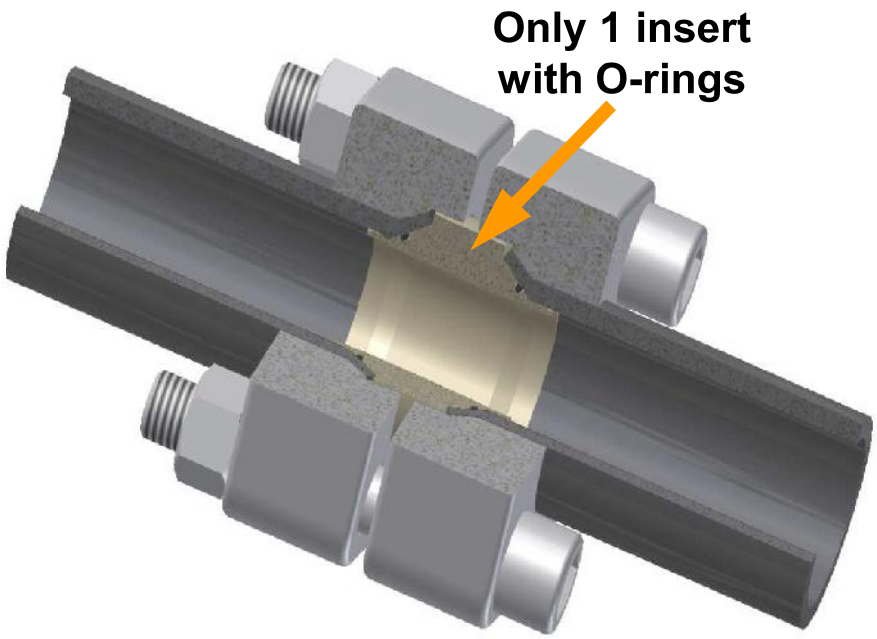
- **F37 seal:** **PUR (green)**
- **Bonded seal:** **NBR / steel or NBR / stainless steel, depending on material of adapter/insert**
  (on demand: FKM with steel or stainless steel)
- **O-ring*:** **NBR as standard for both, S & SS**
  (on demand: FKM)



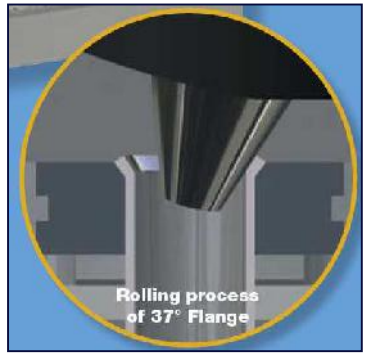



*O-Ring on tube side of insert or face side of adapter

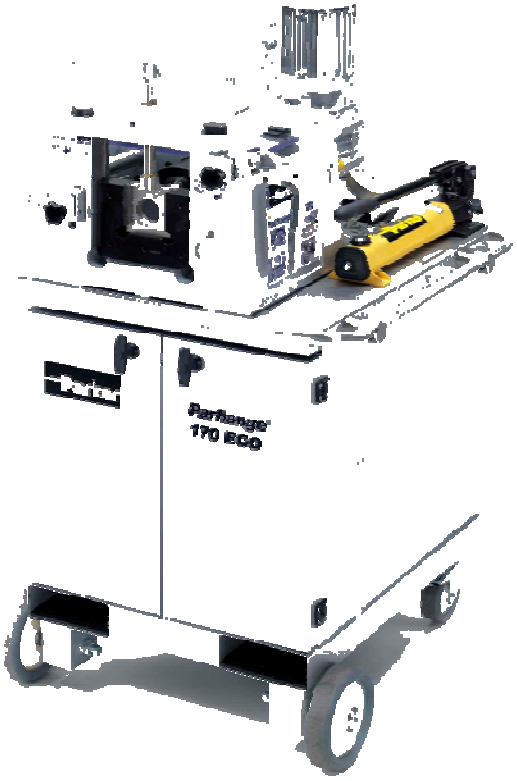
Parflange® F37
Tube-to-Tube Connection



Parflange® F37
Flaring Equipment

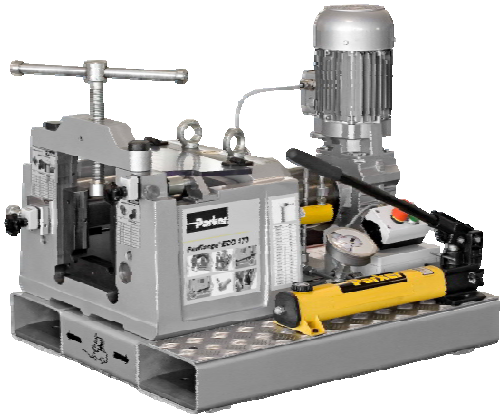


- Millionfold proven Parflange ® process
- Superior smooth sealing surface
- No special tube cleaning before or after flanging
- Flexible on-site flanging
- Robust machine design
- Simple manual operation
- Quick and easy tool change
- For steel and stainless steel tubing
- Maximum capacity 168.3 x 2.77mm



Parflange F37 Parker

Parflange® 170
2 Versions

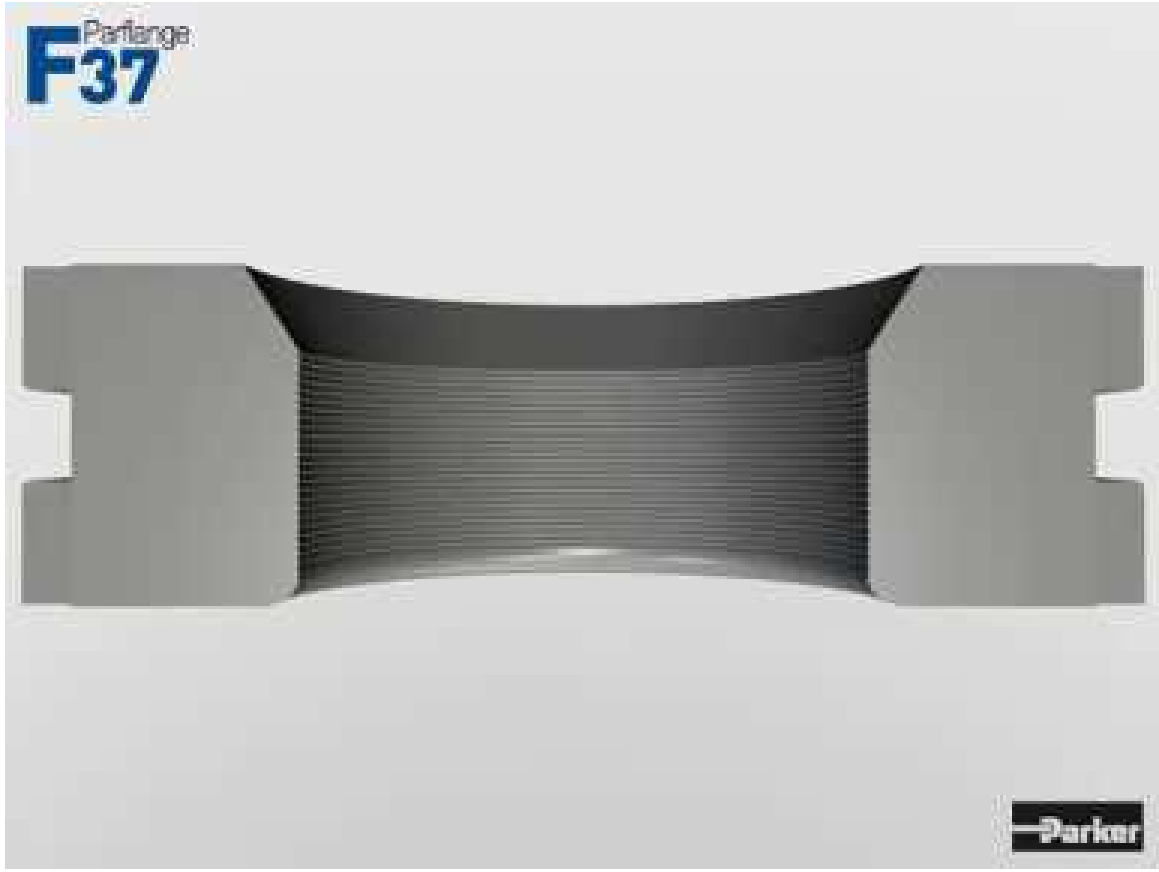


Parflange® 170 ECO
for workshop use
(MRO, smaller projects)

Parflange® 170 WCM
WorkCenter solution
(OEM, bigger projects)

Parflange® 170 ECO and WCM with same flaring unit and tools.

F37 Flaring Process



F37 Tube-to-Flange Connection

Parflange® F37
Retaining Ring System

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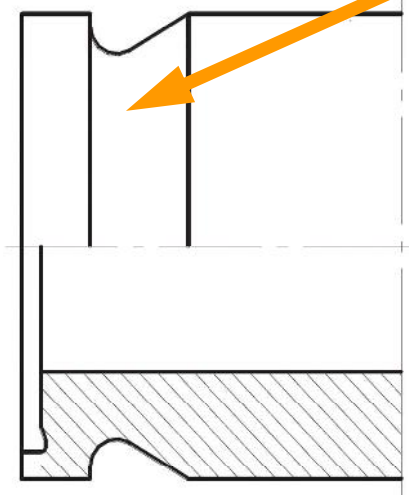
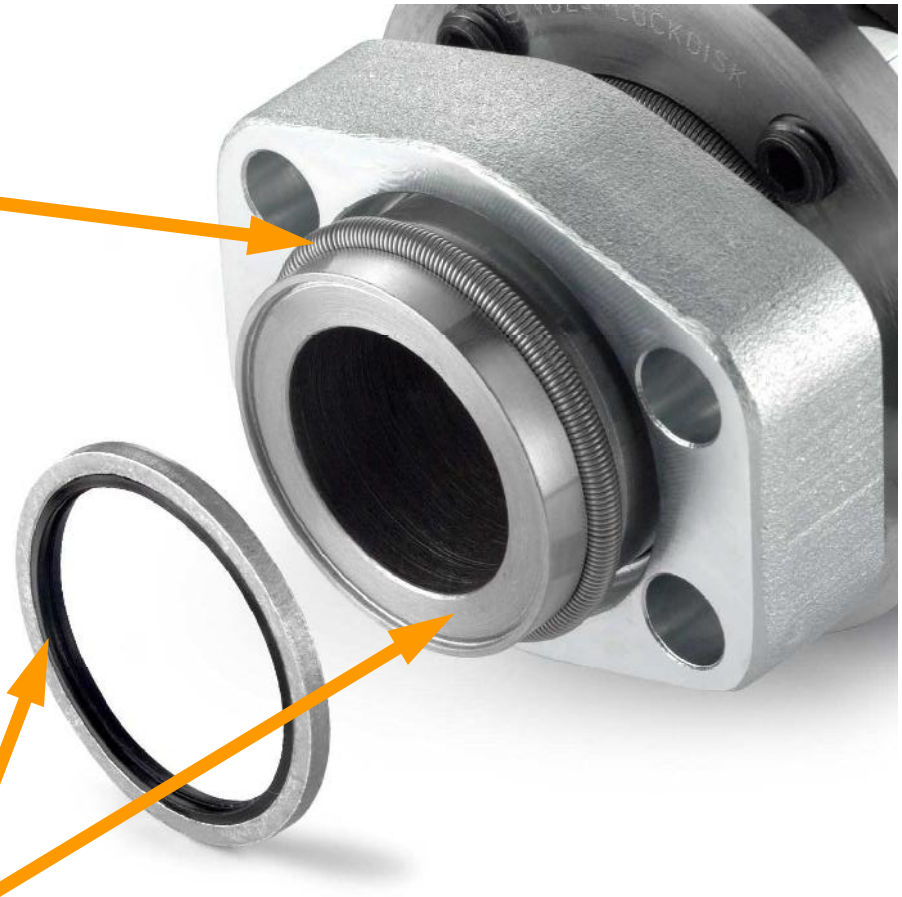
Parflange® F37
Retaining Ring System

Machined tube or part end

- **Outer groove for retaining ring**

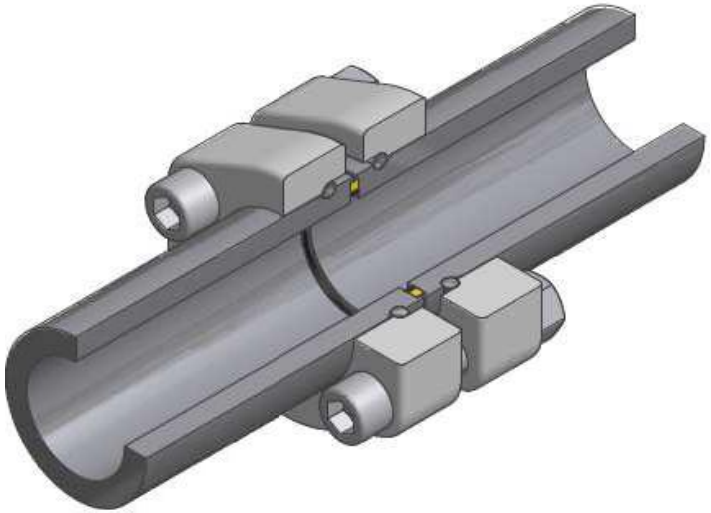




- **Front groove with Bonded Seal**

F37 Retaining Ring System

- For this connection a retaining flange is used together with a retaining ring
- The ring is assembled in a machined groove on the tube end or adapter
- By tightening this system, the flange is pushed against the ring, thus giving a form tight connection

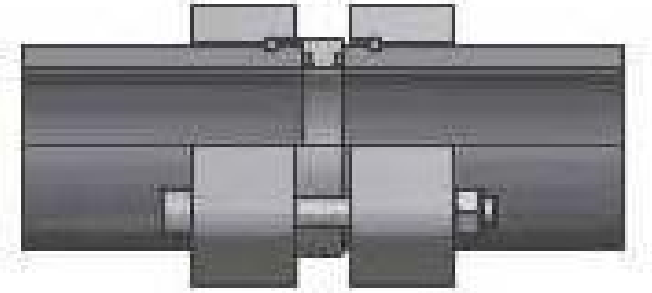


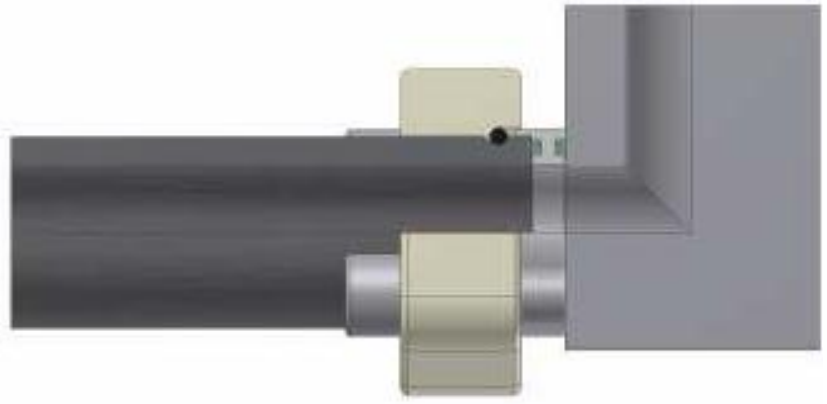
F37 Retaining Ring Connection

Parflange® F37
Retaining Ring System

Pipe Seal Carrier (PSC)

- **Alternative design to bonded seal (soft sealed)**
- **Consistent F37 sealing solution**
- **Much easier pipe end grooving (no front recess necessary)**
- **Available for SAE 3000, SAE 6000 and ISO 6164**





Parflange® F37

Parflange® F37/RR SAE 1000 Series

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Parflange® F37

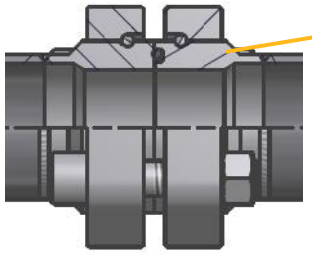
SAE 1000 Series – Flaring System

- F37 flaring system range
- „Lighter“ flanges based on SAE 3000 footprint
- Flange sizes from 1 ½“ to 10“
- Only one tube size per flange size (no sleeves necessary)

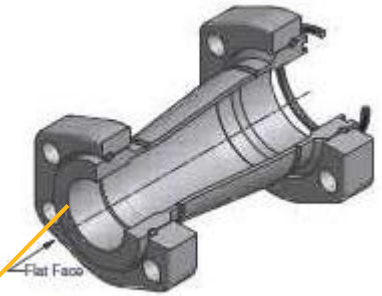
Parflange® F37

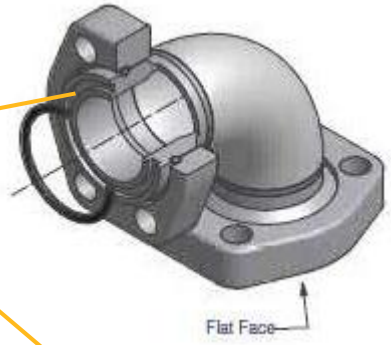
SAE 1000 Series – Retaining Ring System

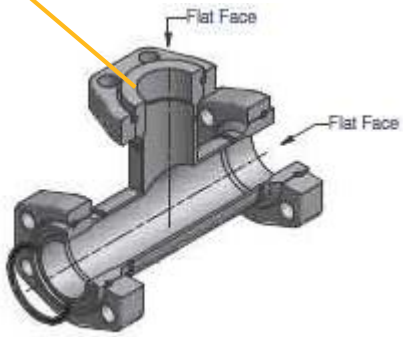
- **Weld-adapter based retaining ring system**
- **„Lighter“ flanges based on SAE 3000 footprint**
- **Flange sizes from 1 ½“ to 10“**



Weld adapter







Part combination retaining ring SAE 1000 (O-Ring) connection

Flange pressure (bar)	Size Inch	Flange	Retaining Ring	O-Ring	Bolts Tube to Port	Bolts Tube to Tube	Nut
70	1 1/2	R-124-CFX	R124X	OR47.22X3.53X	4 x ZYLS12X40	4 x ZYLS12X65	4 x ISO4032-M12
	2	R-132-CFX	R132X	OR56.75X3.53X	4 x ZYLS12X40	4 x ZYLS12X65	4 x ISO4032-M12
	2 1/2	R-140-CFX	R140X	OR69.44X3.53X	4 x ZYLS12X40	4 x ZYLS12X65	4 x ISO4032-M12
	3	R-148-CFX	R148X	OR85.32x3.53X	4 x ZYLS16X50	4 x ZYLS16X80	4 x ISO4032-M16
	3 1/2	R-156-CFX	R156X	OR98.02X3.53X	4 x ZYLS16X55	4 x ZYLS16X90	4 x ISO4032-M16
	4	R-164-CFX	R164X	OR110.72X3.53X	4 x ZYLS16X55	4 x ZYLS16X90	4 x ISO4032-M16
	5	R-180-CFX	R180X	OR136.12X3.53X	4 x ZYLS16X70	4 x ZYLS16X110	4 x ISO4032-M16
	6	R-196-CFX	R196X	OR158.34X3.53X	6 x ZYLS16X70	6 x ZYLS16X110	6 x ISO4032-M16
50	8	R-1128-CFX	R1128X	OR219.3X5.7X	8 x ZYLS20X70	8 x ZYLS20X120	8 x ISO4032-M20
	10	R-1160-CFX	R1160X	OR269.3X5.7X	8 x ZYLS20X80	8 x ZYLS20X150	8 x ISO4032-M20

Parflange® F37: Catalogue 4162

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Parflange F37 non-welded flange system

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CPS - Complete Piping Solutions

Global Strategy

Parker

Parflange F37 non-welded flange syste

CPS Complete Piping Solutions

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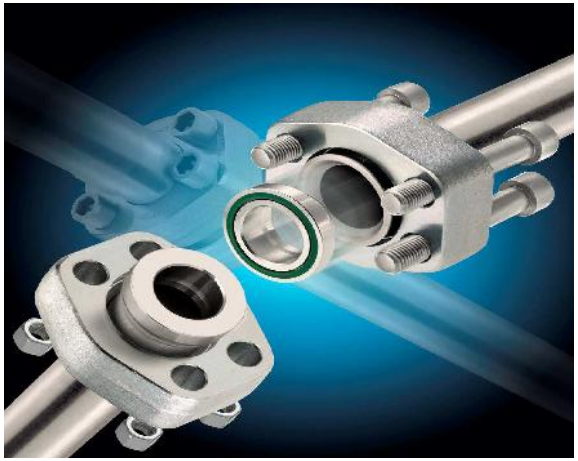
Complete Piping Solutions

Start in 2007

- Product launch Parflange F37
- Opening of 1st Piping Center Ålesund - Norwegen
- Production of pipe kits



CPS - Complete Piping Solutions

Location Germany

Parker

Parflange F37 non-welded flange system

CPS Complete Piping Solutions

ENGINEERING YOUR SUCCESS.

CPS - Complete Piping Solutions

Location Germany

Engineering & Design

- **Modern CAD System**
- **Piping Engineering & Re-engineering**
- **On-site tube measurement, documentation and dimensional control with state of the art coordinate measuring system**

Tube Preparation

- **Tube bending on 3 CNC controlled machines**
- **Cold bending pipes from Ø 6x1mm to Ø 220x25mm Flaring / Tube end preparation on CNC controlled**

Installation

- **Direct shipment of pipekits according to customer request**
- **On-site Training and Installation Support**

CPS Workshop

CNC Saw

CNC Grooving Machine

CPS – Workshop

CNC Cold Bending Machines

Bending Range

from 6 to 220 mm Tube OD

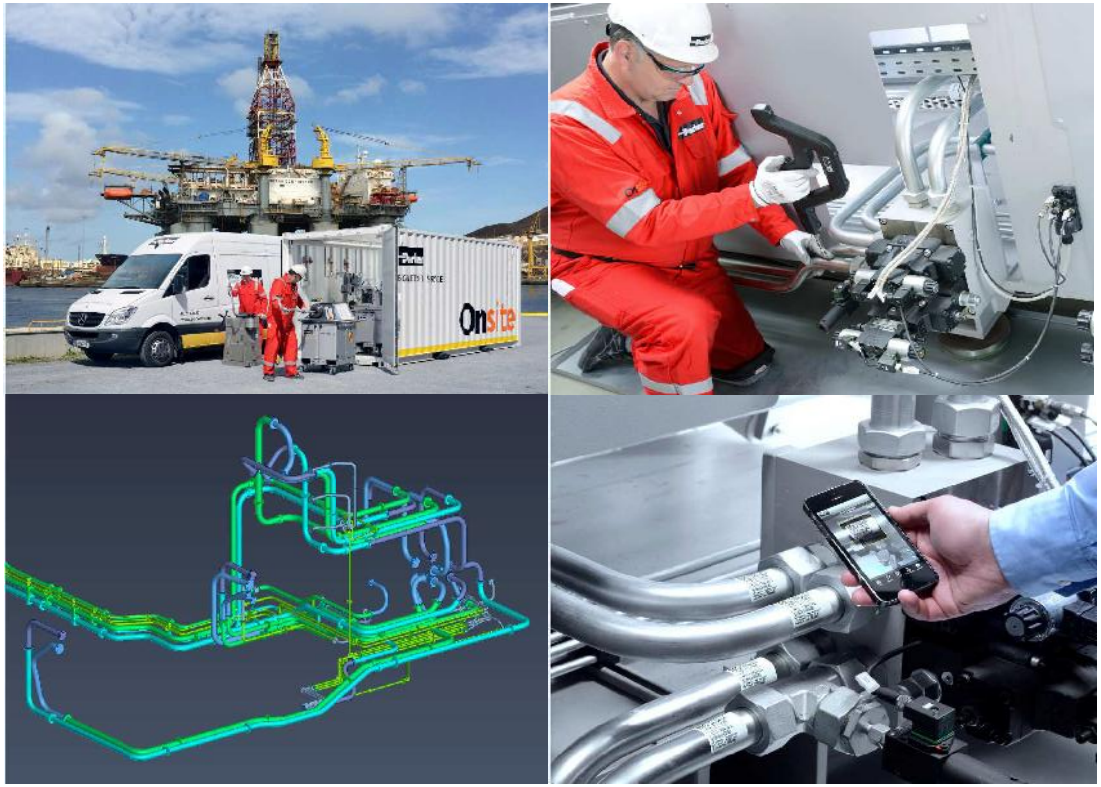
CPS – Workshop

Tube End Preparation

CPS

Parker

CPS Complete Piping Solutions



ENGINEERING YOUR SUCCESS.

Parker OnSite

Onsite Services

People

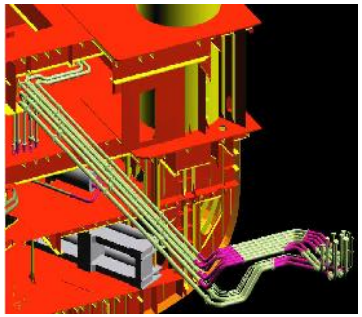
- Parker (Supervisor)
- Sub-Contracted or Distribution

Equipment

- Mobile Work Containers

CPS Services

OnSite Measurement



Engineering Services

Prefabrication

OnSite Container

Installation Service

OnSite Container

Workshop Container

- Work bench
- Shelves for components
- Cutting saw for pipes
- Portable bending machine (up to 60 mm)
- EO2 / F37 / HPF assembyl machines

Parker Flushing Unit

- Flow of 3000 l/min
- Particle counter
- Pressure testing up to 700 bar
- Offshore 2.7-1 DNV approval

Parflange® F37
Markets

ENGINEERING YOUR SUCCESS.

Parflange® F37
Markets

- Offshore
- Marine
- Construction & Mobile
- Heavy Machinery
- Plastic Molding Machinery
- Presses
- Pulp & Paper
- Recycling