



**Flexible Engineered Solutions**



# INLINE SWIVELS

Triple action bearing system with a sealing system designed to suit project environment, providing leak-free fluid transfer during rotation



The FES International Inline Swivel combines practical experience and precision engineering to ensure efficient performance to suit bespoke client requirements.





# INLINE SWIVELS

Continuous engineering design & development combined with comprehensive testing programmes ensure that the FES Swivel Systems remain at the forefront of swivel design technology.

With over 15 years experience in the industry, FES have provided Inline Swivels to multiple clients, including Petrofac, Aker Solutions, Xcite Energy, PTTEP, Total , and many more.

An extensive sub-supplier and manufacturer network allows FES to quickly supply swivels to meet even the most demanding project lead times, and a range of bespoke in-house test rigs ensures testing can be carried out to meet a range of client and international standards.

To ensure that the FES Swivel Systems are installed and commissioned successfully, an installation team including skilled and qualified engineers and technicians has been brought together to ensure that critical stages of installation are carried out in accordance with approved installation & testing procedures and methods.

# INLINE SWIVELS

Flexibility in design

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FES create bespoke Inline Swivels carefully designed to meet project needs. These swivels can therefore be produced to a range of sizes, depending on flowpath size, end connection, design loads and design pressures.

Previous FES products have ranged from **2" Bore to 7 1/16" Bore**, with diameters ranging from 240mm to 930mm and lengths from 350mm to over 1400mm.

Utilising a wide range of seal designs and configurations, designed with input from industry leaders in sealing solutions, FES Inline Swivels are engineered to meet all client design pressure needs.

FES Inline Swivels also incorporate a leak port to allow quick and easy detection of any fluid leakage, allowing for maintenance to be carried out as soon as possible if required.

FES Inline swivels have operated at a number of pressures and with various fluid mediums, including drilling fluids, hydrocarbons and gases, with design pressures ranging from 2,500 PSI (172 bar) to 15,000 PSI (1034 bar).



# INLINE SWIVELS

## Connections

FES Inline Swivels can be supplied with a wide range of End Fitting Connections including Hubs manufactured to Techlok, Grayloc and API 16A specification, Flanges in accordance with API 6A, ANSI B16.5, Weld Preparations and Hammer Lug Unions.



# INLINE SWIVELS

Built for all loading parameters



**AXIAL**



**RADIAL**



**BENDING**

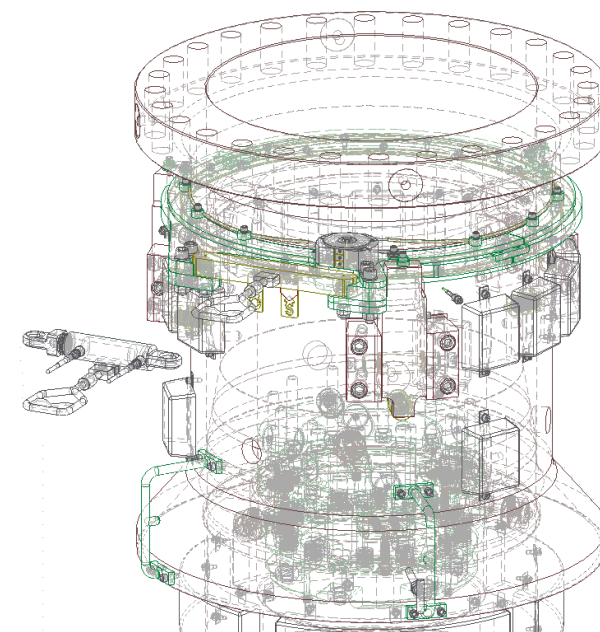
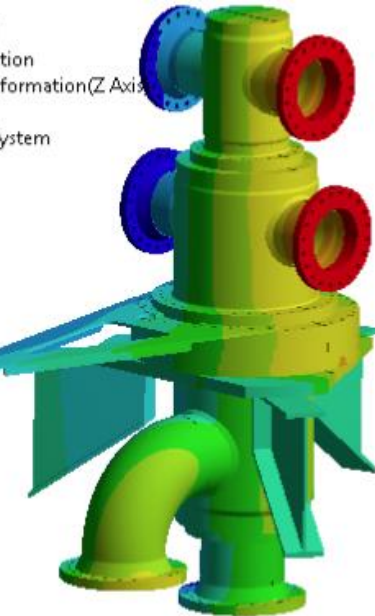
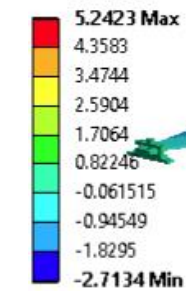
Using a comprehensive triple action bearing system, FES Inline Swivels are engineered to withstand axial, radial and bending loads during product design life. Previous FES Inline Swivels have been designed with maximum axial loads from **10 tonne to over 450 tonne**, and the range of bearing designs available ensure all project loading requirements can be accounted for.

# DESIGN & ANALYSIS

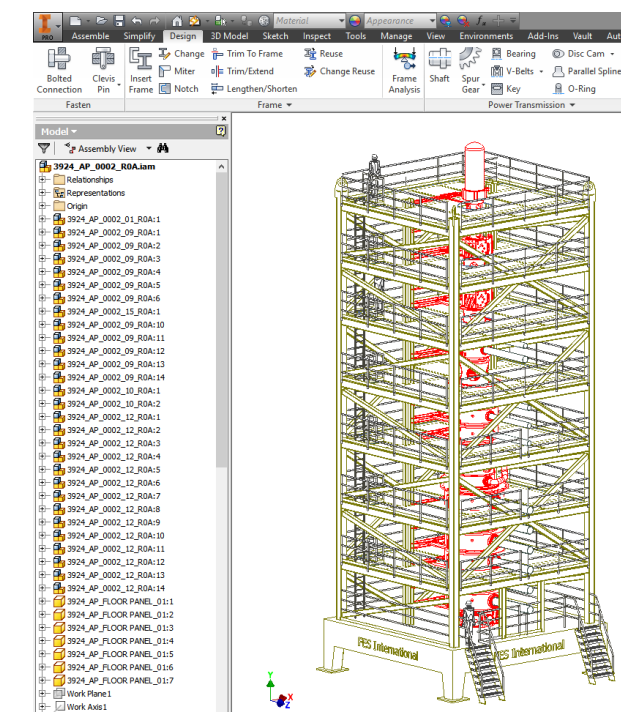
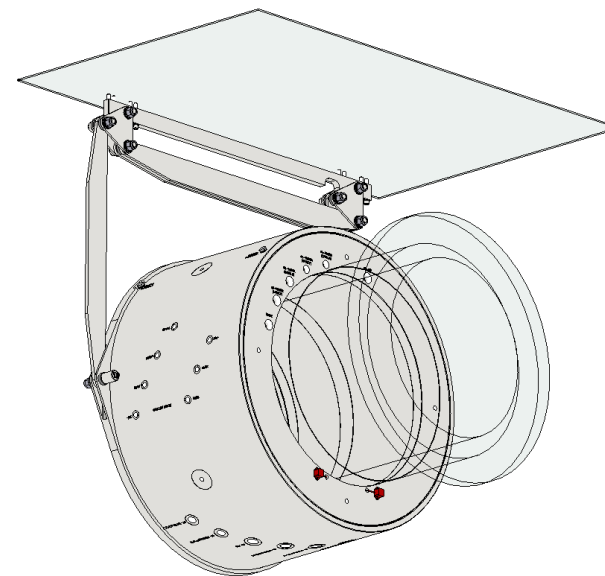
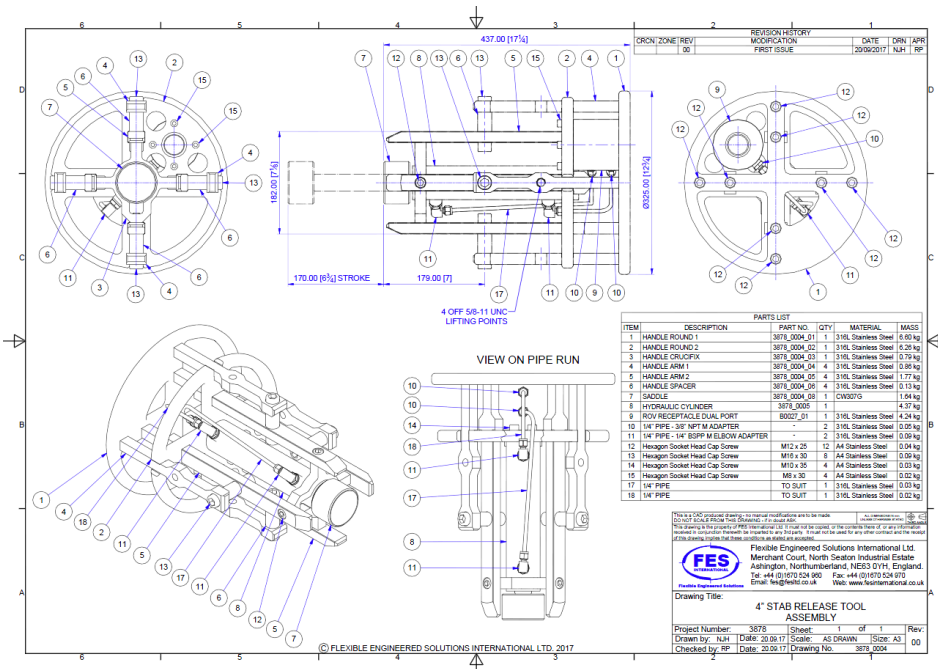
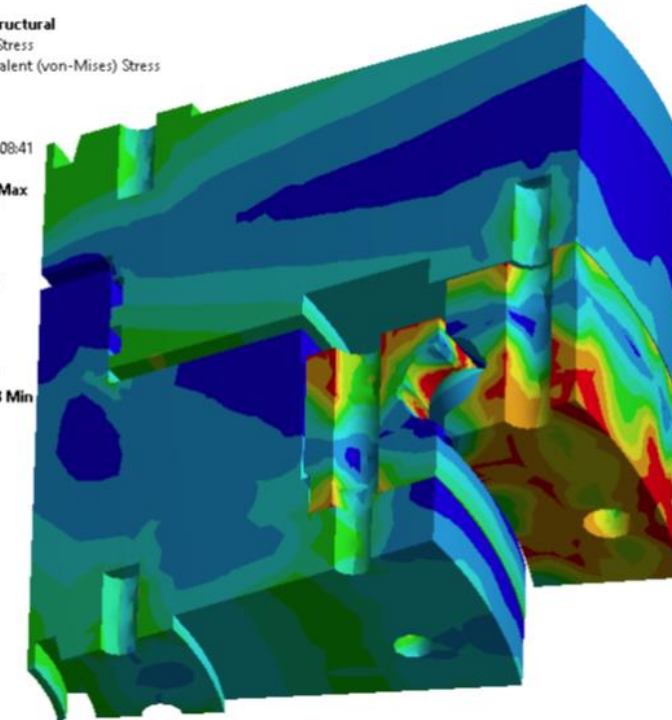
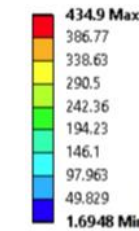
FES International utilise highly qualified technical personnel and the latest software to design and analyse our products



**B: Static Structural**  
Directional Deformation  
Type: Directional Deformation(Z Axis)  
Unit: mm  
Global Coordinate System  
Time: 1  
16/03/2018 08:59

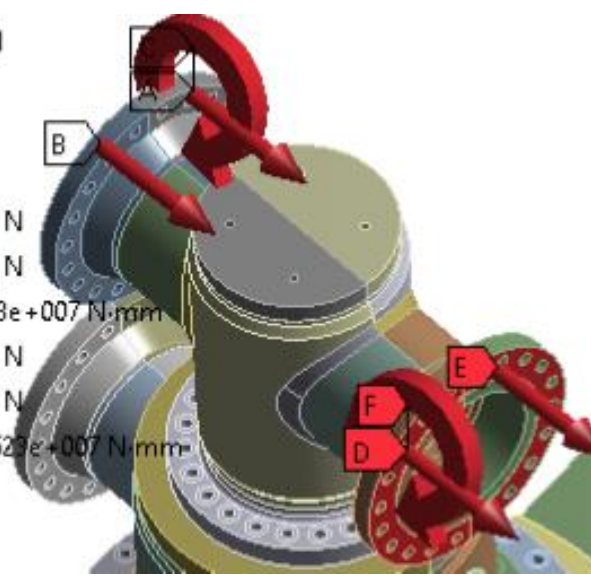


**B: Static Structural**  
Equivalent Stress  
Type: Equivalent (von-Mises) Stress  
Units: MPa  
Time: 1  
Custom  
20/10/2016 08:41



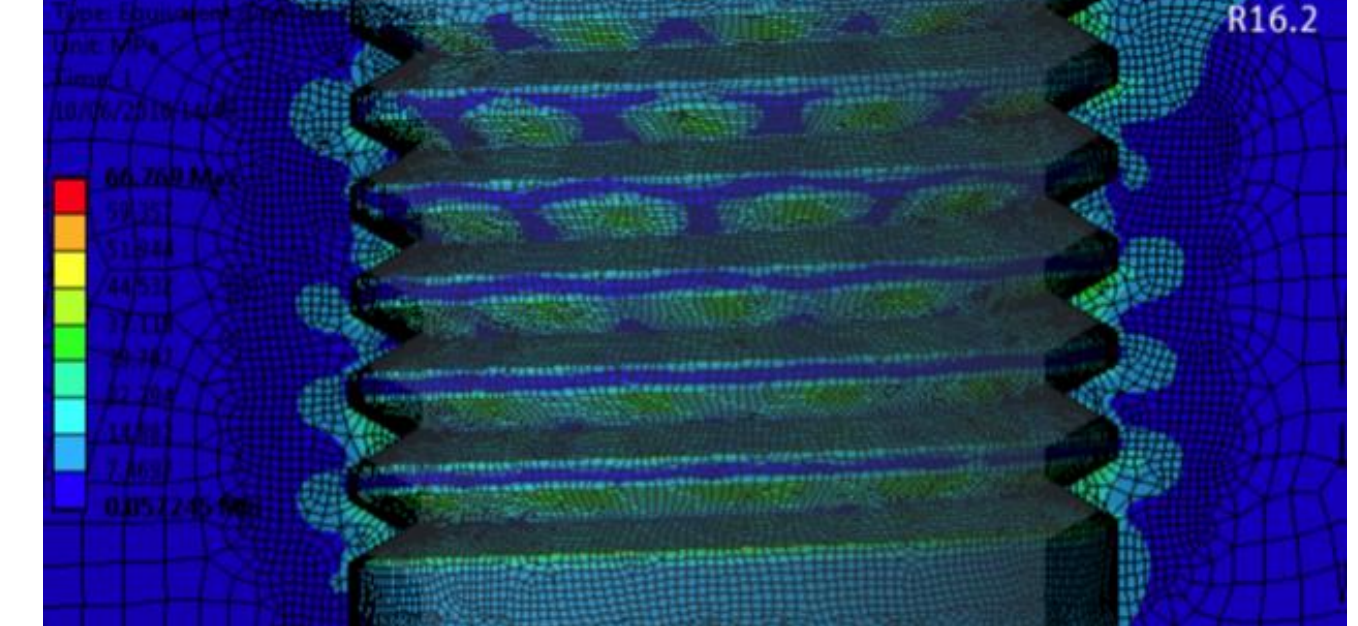
**B: Static Structural**  
Moment 3  
Time: 2. s  
16/03/2018 11:23

- A** Force 14: 16361 N
- B** Force 15: 16361 N
- C** Moment: 3.1623e+007 N-mm
- D** Force 18: 16361 N
- E** Force 19: 16361 N
- F** Moment 3: 3.1623e+007 N-mm



**A: Static Structural**

Equivalent Stress 2



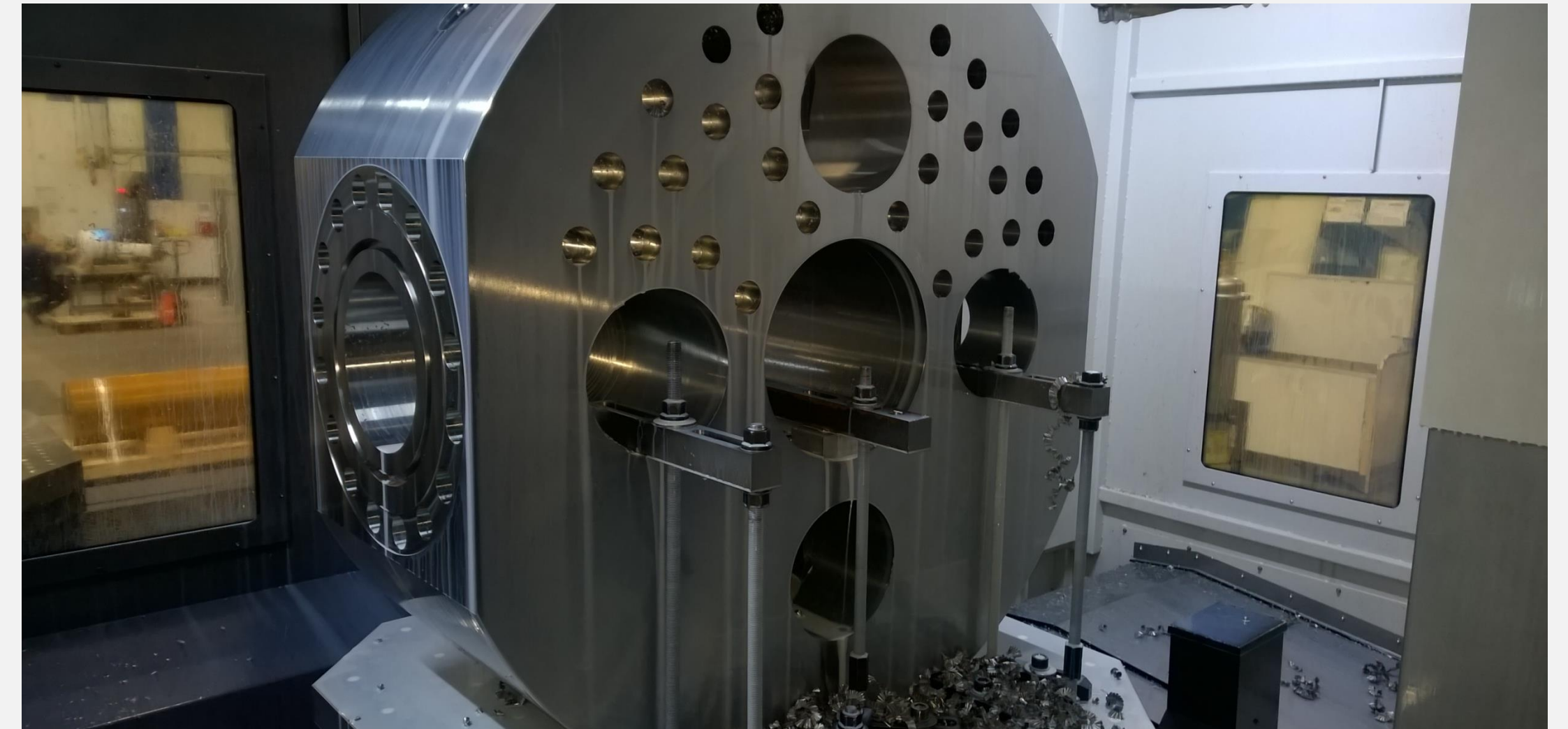
A combination of calculations in accordance with industry standards, sophisticated computer software & the latest FEA programmes are utilised to achieve the necessary design parameters and a first class engineered solution to each client project specification.

# MANUFACTURE, ASSEMBLY & TESTING

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## MANUFACTURE

All components are designed and manufactured by FES International and approved sub suppliers, ensuring that we retain control of product quality and material traceability.



## ASSEMBLY & TESTING

In-house assembly and testing facilities ensure all test procedures and inspection & testing plans are strictly adhered to.

# MANUFACTURE, ASSEMBLY & TESTING

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## TESTING

Using bespoke in-house test rigs, FES are capable of testing to a range of international standards and client specifications, completing load, pressure and rotation testing where required.

FES previously performed Inline Swivel testing to ISO 10423 F.1.11.

This 24 hour-a-day 7 day testing programme involved subjecting the seals to intense pressure temperature cycling from 2°C to 121°C while under pressures of up to 10,000PSI. The test medium for this was nitrogen gas, and all testing was witnessed and approved by independent inspectors.

This project was believed to be the first test of its kind carried out with a dynamic sealing environment.



# QUALITY, HEALTH & SAFETY

FES places quality and safety at the heart of everything we do



Certificate  
No:33532021



Certificate  
No:114742021



Certificate  
No:204072021

## QUALITY MANAGEMENT

Our quality management system has been assessed and accredited to ISO 9001:2015

Further illustrating our commitment to QHSE, our quality management system has also been assessed and certified to the stringent industry specification API Q1.

## HEALTH & SAFETY

Our health and safety management system has been assessed and accredited to OHSAS 45001:2018

## ENVIRONMENTAL

FES has been assessed and accredited to ISO 14001 certification for environmental management.

# KEY FEATURES

## FES Inline Swivel

- Design Pressures up to 15,000 PSI.
- Axial Loads up to 450+te.
- Range of sealing options for differing fluid media and pressures.
- Comprehensive triple-action bearing system to withstand high axial, radial and bending loads.
- Broad testing programme using bespoke in-house test rigs.
- Leak Detection Ports allow any seal leakage to be quickly identified.
- Wide range of End Fitting Connections can be supplied including Hubs manufactured to Techlok, Grayloc and API 16A specification, Flanges in accordance with API 6A, ANSI B16.5, Weld Preparations and Hammer Lug Unions.
- Extensive Sub-Supplier and Manufacturer network allow quick supply of bespoke swivels to meet client project lead times.



# Contact Us

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