



**STATS GROUP**  
Managing Pressure, Minimising Risk

**DNV-GL Type Approved  
Weldless Mechanical Connectors & Couplings**

- ❖ Company Overview
- ❖ On-Site Hot Work Challenges
- ❖ STATS Weldless Connections Overview
- ❖ Connections Key Features and Benefits
- ❖ DNV-GL Type Approval and Testing Regime
- ❖ Training and Installation





**Established in 1998, STATS provide a comprehensive range of products and pipeline engineering services enabling piping isolation, intervention, repair, and shutdown services.**

- ❖ 21 years in operation
- ❖ Globally employing 250 people
- ❖ Headquartered in Kintore, UK
- ❖ Also operating through 8 additional branch entities worldwide:  
Houston, Edmonton, Calgary, Kendal, Abu Dhabi, Doha, Kuala Lumpur and Perth



# CHALLENGE: ON-SITE WELDING

## Hot Work Disadvantages

- ❖ Risk of fire / explosion
- ❖ Requirement to shutdown plant
- ❖ Habitat required
- ❖ Finite resources / skills
- ❖ NDT inspection required
- ❖ Additional personnel / accommodation requirements
- ❖ Time taken to weld / inspect

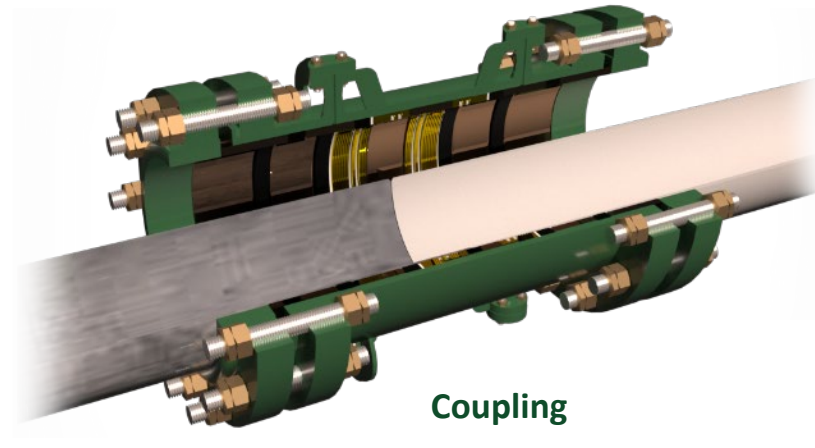
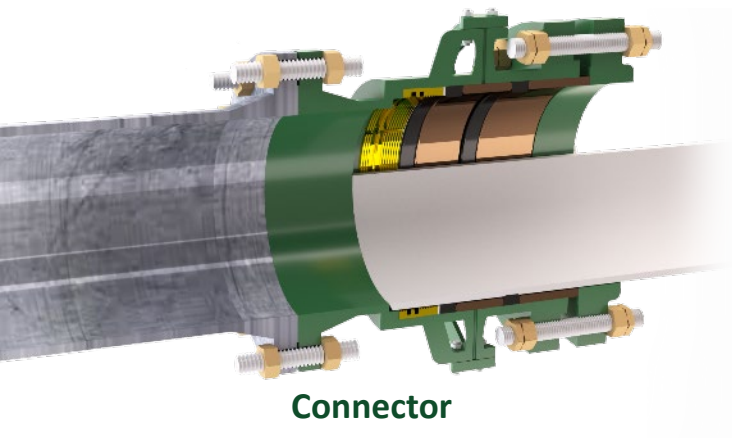


# WELDLESS PIPE CONNECTION

DNV-GL Type Approved Mechanical Connectors and Couplings

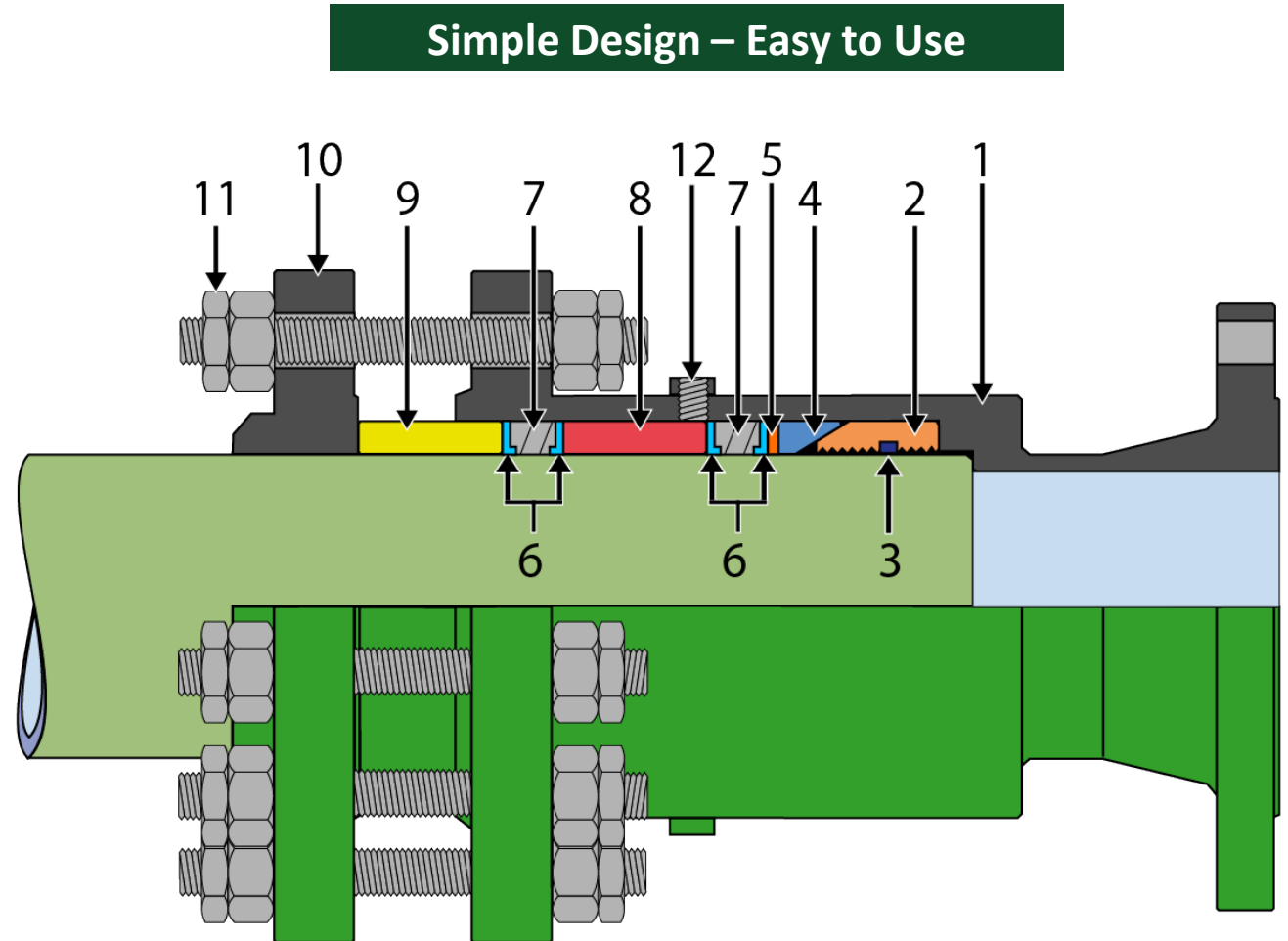
Permanent pipe connection with 20 years design life: 100% Leak free in-service history

In use since 2004 by major operators including: BP, CNR, Chrysaor, Equinor, Nexen, Shell, TAQA Bratani and others

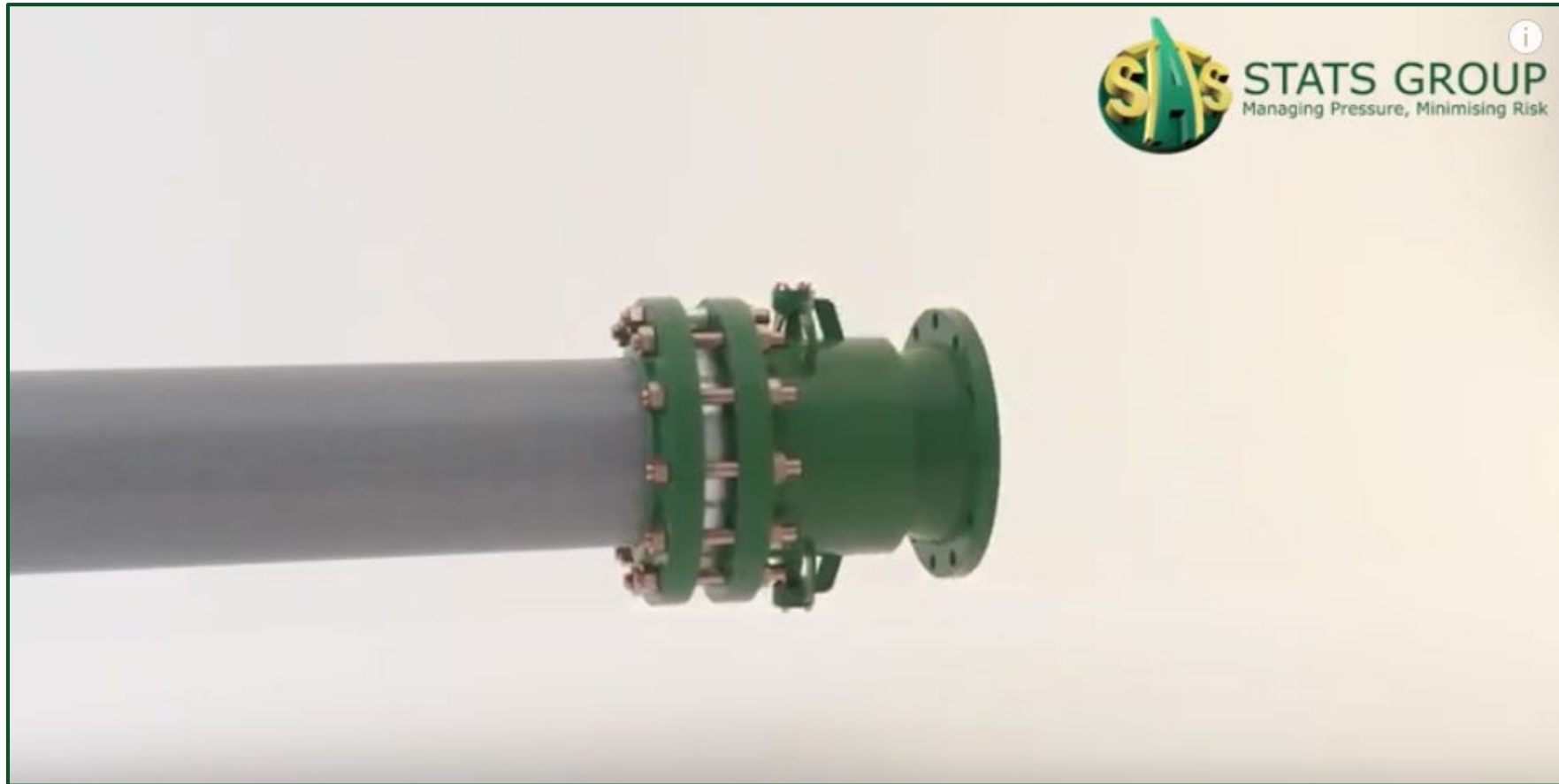


# CONNECTOR KEY COMPONENTS

Number	Description
1	Connector Body
2	Segmented Locks
3	Lock Retaining Ring
4	Lock Bowl
5	Lock Bowl Backup Ring
6	Anti-Extrusion Rings
7	Packing Element (Graphite Seals)
8	Seal Spacer Ring
9	Compression Ring
10	Compression Flange
11	Studbolt c/w Full Nut & Half Nut
12	Integrated Test Port



# WELDLESS CONNECTION



[Click to View the Animation](#)

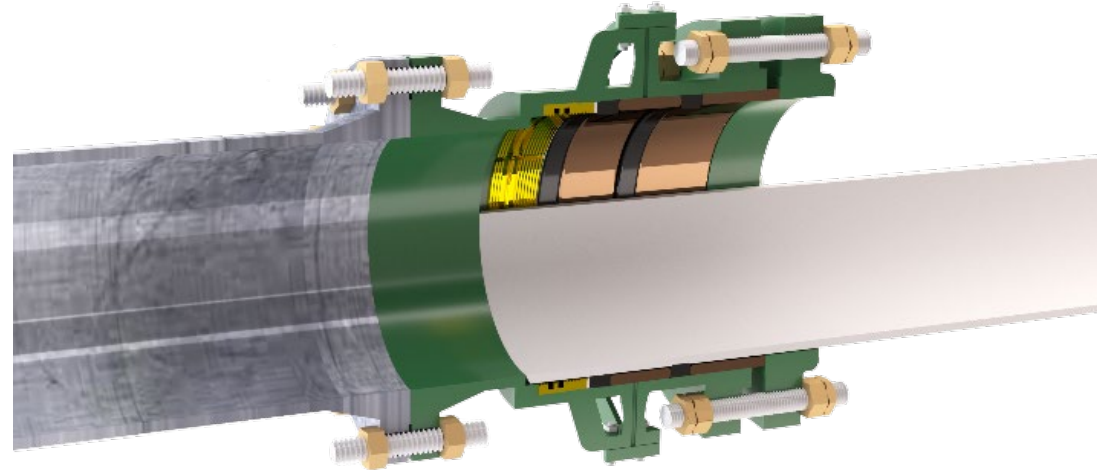
## Weldless Connector Key Features

- ❖ Standard sizes 2" to 36" – RF / RTJ Flange Options
- ❖ Standard MAOP: Up to 51 barg – Higher pressures available
- ❖ Standard temperature range: -40°C to +300°C
- ❖ In accordance with the API 6H Specification requirements
- ❖ Fire tested to comply with API 6 FA
- ❖ NACE MR-01-75 / ISO 15156 Compliant
- ❖ Design strength verified to ASME B31.3, B31.4 and B31.8
- ❖ Designed to fit standard pipe specifications (ASME B36.10 & B36.19, API 5L)
- ❖ Manufactured in compliance with PED 2014/68/EU – CE Marked
- ❖ Testing and verification port to carry out leak testing and seal monitoring
- ❖ Xylan 1425 coated internal and external as standard
- ❖ Carbon steel applications as standard (Duplex and SS on request)





# WELDLESS PIPE CONNECTION BENEFITS



<b>Safety</b>	Eliminates the need for hot work activities
<b>Time</b>	Significantly quicker to install compared to welding
<b>Cost Effective</b>	Eliminates welding equipment, personnel, habitat and personnel resources
<b>Easy to Install</b>	No specialist installation tooling required – Hand tools only No requirement for additional coating once installed
<b>Test and Monitor Facility</b>	Integrated test port to prove connector sealing without additional tooling
<b>Avoids Pipe Deformation</b>	External lock and seal assembly eliminates flow restriction or turbulence. Applies code compliant connection loads into pipe, avoiding any localised material deformation or overstress conditions

DNV-GL	
<b>TYPE APPROVAL CERTIFICATE</b>	
Certificate No: <b>TAP00000BE</b>	
Revision No.:	
<b>This is to certify:</b>	
<b>That the mechanical connectors and couplings</b>	
with type designation(s) LC series	
Issued to <b>STATS UK Ltd</b> <b>ABERDEENSHIRE, United Kingdom</b>	
is found to comply with <b>DNV-OS-F101 Submarine Pipeline Systems (2013)</b> <b>DNV-RP-F113 Pipeline Subsea Repair (2007)</b>	
and with DNV GL's current understanding and interpretation of the ASME BPVC.VIII.1-2015 and ASME B31.3-2014.	
<b>Application :</b>	
The connectors and couplings approved by this certificate are accepted for installation on steel pipelines for utilities, oil and gas transport. Conditions and limitations are given below and in reference documents. Design to follow approved design documentation and test procedures given in the reference documents.	
Temperature range:	-40 to +300°C
Max. working press.:	51.1barg
Sizes:	2" to 36"



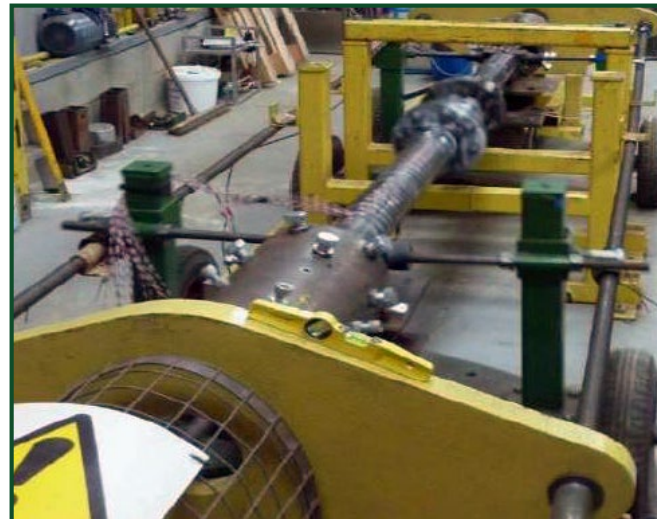
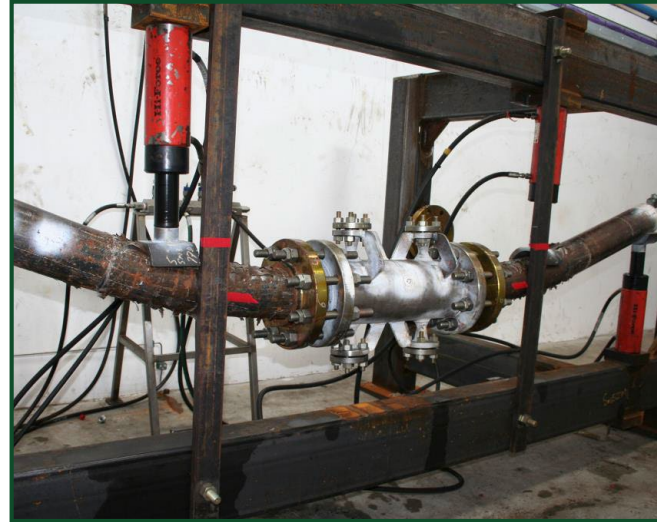
*14" Connector – Equinor July 2018*

## Testing in accordance with ISO 21329

- ❖ Pressure Test
- ❖ Torsion Test
- ❖ Pressure Test to Failure
- ❖ Bending Test to Failure
- ❖ Tensile Test to Failure
- ❖ Bending Fatigue Test

## Fire Safety Testing in accordance with API 6FA

- ❖ Jet fired to a temperature of min 761°C for 30 mins



*Bending and Torsion Testing*



## Testing Results – 4" 300# Sch. 40 Connector

- ❖ Connectors were pressure tested to 345 Bar at which point an annulus leak was detected – No atmospheric leak occurred
- ❖ Bending moment of 41,000Nm applied with no leakage detected (Test fixture limit)
- ❖ Tensile force of 46.2 Tonnes applied with no leakage detected (Test was stopped)
- ❖ Connectors were subjected to temperatures of min 761°C for 30mins with no leakage detected (tested at over 950 °C)
- ❖ Bending fatigue results were coincident with the BS7608 Class G2 design curve
- ❖ Connectors were subjected to over 1.54M bending fatigue cycles before failure occurred (internal pressure 50 Bar) – Testing performed by The Welding Institute

**FIRE TEST QUALIFICATION CERTIFICATE**

Score (Europe) Ltd

Item	Pipe Connection (General Assembly)
Size	4"
Class	150
Serial No	LC-01-4-115
Body Material	A333 Grade 6
Seal	Graphite (Supergal Premier)
Manufactured by	STATS (UK) Ltd
In accordance with job number	134986 COW
In accordance with drawing number	1A.19.0020.00.AA

The above valve was tested by Score (Europe) Ltd at their Specialised Valve Research and Test Centre, Cowdenbeath, Scotland and the results have been recorded as a PASS, having complied with the minimum performance requirements stated in specification

API6FA setup, pressures, temperatures & leakage rates

Test date 02/12/04

Other sizes qualified 4" through to 6", 100PN to 200PN

Other pressure ranges qualified 150, 300, 1000N to 1250N

Tested by J. O'Hagan / S. Fox / R. Hepburn

Witnessed by W. Todd / S. Gibben

D. Vernon - STATS (UK) Ltd

S. Gibben - STATS (UK) Ltd

QA INSPECTION

This certificate must be read in conjunction with the full Score Test Report Number 134986-2



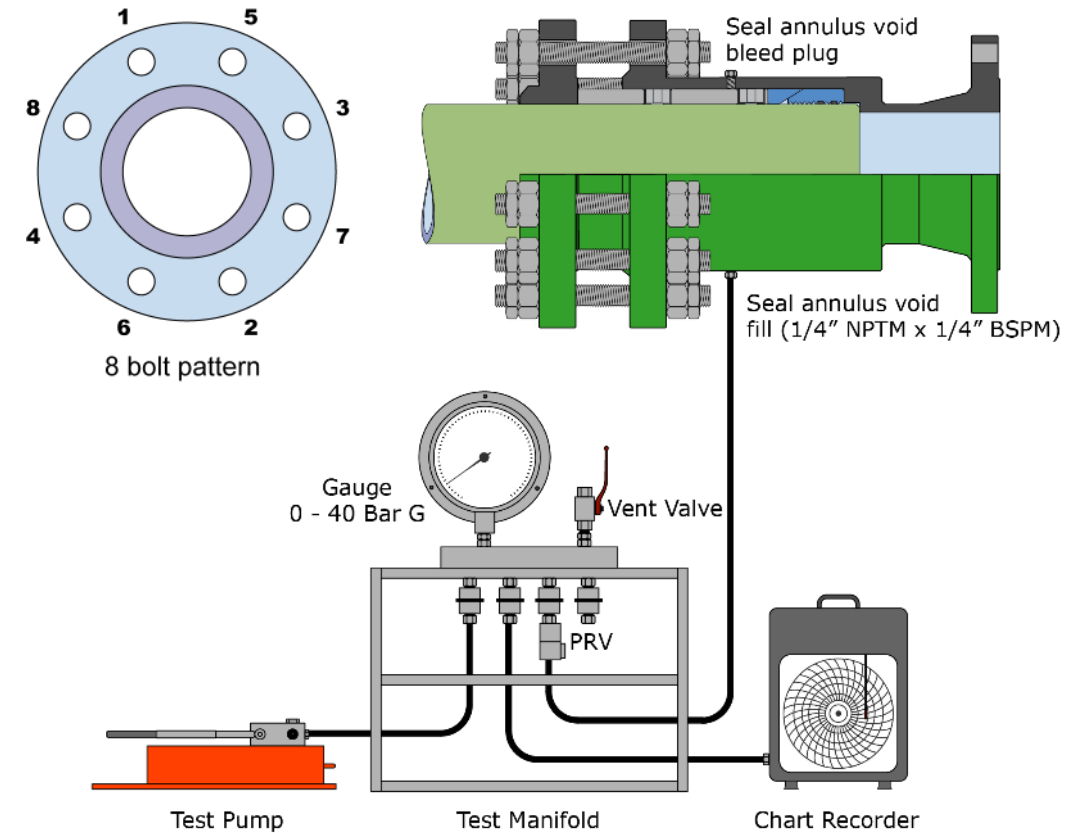
All Connectors are issued with size specific installation procedures. Standard Connectors are built to suit Schedule 40 and 80 pipework.

Preparation of existing pipework includes removal of all existing paint / coatings to expose bare metal. Seam welds should be smoothed.

Connectors are slipped onto the bare pipe and bolted in the same bolting pattern as a standard flange to the outlined bolt torque setting.

Seal verification testing is carried out via the integrated test port up to a pressure of  $1.1 \times \text{Design}$  – 30 min hold period.

Upon completion test ports are capped, allowing future seal integrity inspections / re-testing.



STATS can provide a full training and awareness course as part of our weldless connection product support.

Training consists of detailed one day theory and practical training course delivered at STATS Kintore facility.

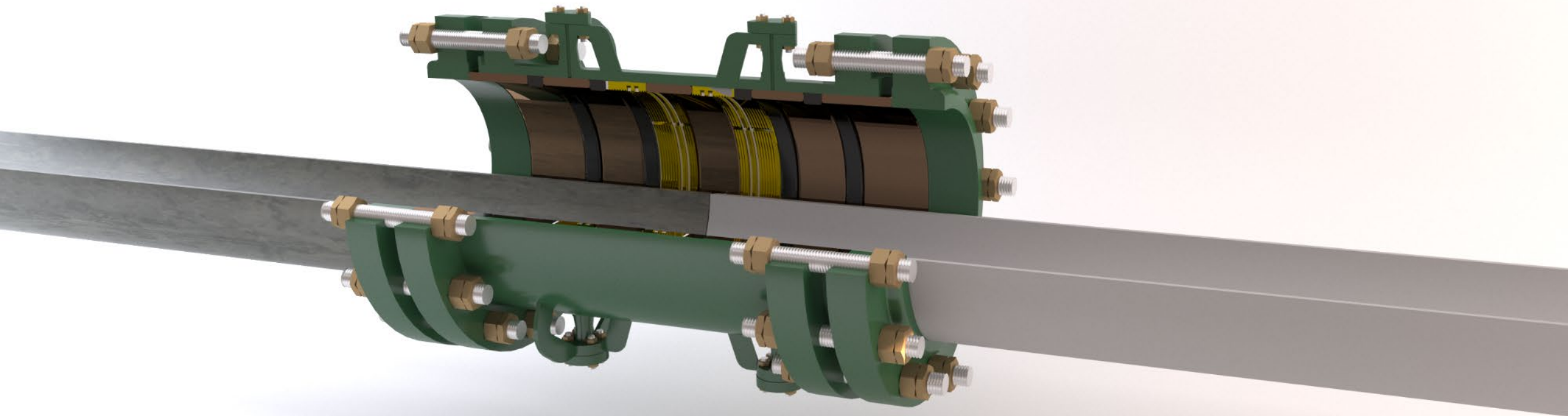
## Training and Awareness Course Description

- ❖ Connectors applications, specifications, operational benefits and key features
- ❖ Connectors operating principles and main components
- ❖ Connector HSE considerations
- ❖ Assembly / disassembly of Connectors and complete pre-installation inspection. (Practical exercise using a connector)
- ❖ Installation and pressure testing of Connectors (Practical exercise using a connector installed vertically)





## Thank You For Your Attention



for more information visit  
[www.statsgroup.com](http://www.statsgroup.com)