



2H
offshore

Flexible Riser Annulus Condition Assessment

an **ACTEON** company

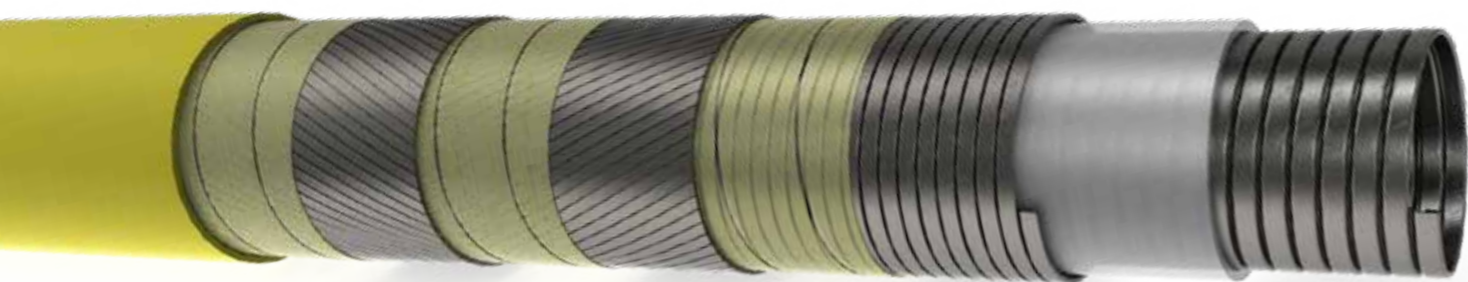
Flexible Riser Annulus Condition Assessment

Risk-based inspection programmes for flexible risers and flowlines have come a long way as a result of extensive collaborative industry effort focused on flexible pipe degradation. 2H Offshore has maximised this information to optimise testing, inspection, and monitoring programmes to detect structural degradation of critical flexible pipe components and interfaces.



Increase precision of IM & life extension

Assessing the integrity of the outer sheath of a flexible riser after installation and on a regular basis during operation is a critical part of any flexible riser integrity management programme. Annulus testing provides essential data to ensure that your assets can perform adequately to attain their intended service lives as well as for life extension evaluations.



Discover accumulated fatigue damage & remnant service life

The findings of outer sheath and annulus condition assessments enable more accurate modelling of the fluid in the annulus. Global fatigue assessments associated with local time domain cross section analysis allow for an accurate evaluation of accumulated fatigue damage and estimation of remaining service life. The ability to define appropriate armour wire annulus conditions at various locations along the riser supports a more precise fatigue appraisal during local cross section analysis, without excessive and typical design conservatism. 2H's irregular wave fatigue methodology allows for the best use of available operational and environmental data.

Prevent operational delays and costly equipment repairs

We can evaluate the remaining fatigue life of existing flexible risers which are approaching or exceeding their original service duration and, in turn, potentially help delay or avoid costly replacement.

Contact us for an evaluation of your integrity management needs and we will explain what you need to do to assess your flexible riser and flowline assets.

FlexTest Flexible Riser Annulus Testing System

Ingress of fluids into the annulus of unbonded flexible risers occurs as a result of outer sheath damage or permeation of fluids from the bore. This affects the strength and fatigue integrity of the steel armour wires located in this region, which will typically result in a reduction of service life.

The FlexTest system is an easily transportable package that can safely and efficiently perform API 17B compliant high-precision annulus testing. Testing is typically conducted:

- Prior to the riser going into operation
- Annually
- Following a severe storm (e.g. 100 year)
- Following an abnormal event such as a dropped object

The 2H FlexTest Annulus Testing System:

- Performs positive pressure or vacuum annulus tests.
- Confirms outer sheath integrity (detect breaches)
- Confirms working annulus vent system
- Estimates the total free annulus volume
- Estimates annulus filling rate as a result of permeation (with regular testing)

Benefits

- Small size and weight - hand transportable in two rugged, offshore cases
- Suitable for Exd classified areas
- No external power requirement
- Gas sampling of the annulus via the gas sampling pod
- Overpressure protection
- High-precision equipment - valves, regulators, flowmeter and datalogger
- Test data evaluated by flexible riser specialists



Key Specifications

Dimensions (L x W x D - mm)	460 x 340 x 170
Operating Pressure [Barg; inHg]	-0.94 to 3.0; -28 to 88
Design Pressure [Barg]	20
Pressure Relief Valve [Barg]	3.0 (adjustable; valves set, tested, locked, and certified to the specified max pressure)
Flow Measurement Accuracy [%]	5
Annulus Free Volume Accuracy [%]	5
Operating Temperature [°C; °F]	-10 to 50; 14 to 122
Storage Temperature [°C; °F]	-20 to 50; -4 to 122



About 2H Offshore

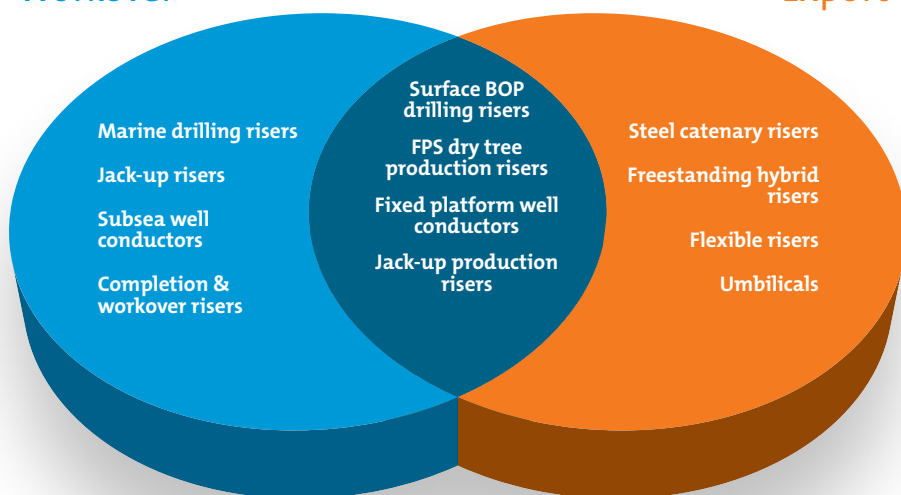
2H Offshore is a global engineering contractor specialising in the design, structural analysis and integrity management of riser and conductor systems used in the drilling and production of offshore oil and gas. Our capability and experience covers all types of risers, from shallow water fixed platform conductors, to drilling and production risers used in ultra-deep water.

Areas of Expertise

Our business falls into two primary categories, **Drilling, Completion & Workover** and **Production & Export**. Engineering of the risers used in each area of activity has many similarities in terms of the skill sets and experience required to conduct the work, but each area has many unique characteristics requiring specific experience and knowledge of the equipment and operations involved. The scope of each area of activity and overlaps that occur are illustrated below.

Drilling, Completion & Workover

Production & Export



To find out more visit www.2hoffshore.com

Houston

2H Offshore Inc.
15990 North Barkers Landing
Suite 200
Houston, TX 77079, USA
T: +1 281 258 2000
houston@2hoffshore.com

London

2H Offshore Engineering Ltd.
Hollywood House
Church Street East
Woking, Surrey, GU21 6HJ, UK
T: +44 1483 774900
london@2hoffshore.com

Aberdeen

2H Offshore Engineering Ltd.
Tern Place House, Tern Place
Bridge of Don
Aberdeen, AB23 8JX, UK
T: +44 1224 452380
aberdeen@2hoffshore.com

Rio de Janeiro

2H Offshore Projetos Ltda.
Praça Floriano, 19-22° andar,
Centro, RJ, 20031-924, Brasil
T: +55 21 2510 7300
rio@2hoffshore.com

Kuala Lumpur

2H Offshore Engineering SDN BHD
Suite 31-1, 31st Floor
Wisma UOA II 21 Jalan Pinang
50450 Kuala Lumpur, Malaysia
T: +60 3 2726 0500
KL@2hoffshore.com

Perth

2H Offshore Engineering Pty. Ltd.
Level 8, 1008 Hay Street
Perth, 6000, Australia
T: +61 (0) 8 9222 5000
perth@2hoffshore.com

Mailing Address:
PO Box 7322, Cloisters Square PO
WA 6850, Australia

Beijing

2H Beijing Representative Office
9C Xinzhong Building
No.2 Xinzhong West Street
Dongcheng District, Beijing, China,
100027
T: +86-10-64165160
beijing@2hoffshore.com

an **ACTEON** company