



Oil and Gas Industry

The Fluid Systems Division of BHR Group offers independent expert advice to support the oil and gas industry

Working in partnership with our clients is key to ensuring a thorough understanding of their requirements and what is driving change within their industries: its processes and its sustainability in today's environments. BHR Group's Fluid Systems division provides core expertise in oil and gas technology in areas such as equipment testing, pipeline network analysis, materials and sealing technology; simulation and analysis.

Benefits

Our technology base is continually enhanced through research and development, industrial funded PhD projects and practical site experience.

We also provide added value consultancy through the tailored application of technology via new projects, repeat contracts, training and customer care to meet our clients specific needs

Equipment testing

Various testing and validation services for fluid handling systems and components are available. Being pioneers of high-pressure sealing and engineering techniques, BHR Group helps clients address both operational and development concerns.

- Lifetime and wear of components
- Solids abrasion and corrosion
- Proof/burst pressure
- Instrument penetrations and performance
- Controlled pressure/temperature rise and decay
- Cyclic, fatigue and sealwear
- Legislation compliance testing
- Permeation/leakage assessment
- Thermal testing – Pipe in pipe
- Zone 2 test area for inflammable materials

We also develop bespoke facilities to meet client's requirements.



Pipeline Network Analysis

We use our own sophisticated transient analysis software FLOWMASTER™, bespoke hydro-transport programs and expertise for hydraulic design, operational and integrity assessment of:

- Fluid handling pipelines and components
- High pressure and temperature systems
- Pipeline design for non-settling and settling slurries
- Sanding out and solids removal systems
- Pipe-in-pipe and pipe bundle systems
- Fire mains, fluid power systems
- Unloading buoys, swivels and connectors

Services include:

- Emergency shutdown and procedures
- Failure investigation and scenario analysis
- Feasibility studies
- Pressure surge and flow distribution analysis
- System design and audit
- Component sizing and pumping requirements



Materials and Sealing Technology

We offer an extensive support on design, materials selection and functionality and testing of all types of static and dynamic seals and polymeric structures including pipe liners. It has developed validated predictive software to shorten the design process and testing facilities to assess performance.

Simulation and Analysis

With more than 60 years of experience in fluid engineering, means that we can provide a wide range of comprehensive engineering solutions from product and process design to optimisation and performance enhancement through computer simulations for the oil and gas industries.

Fluids

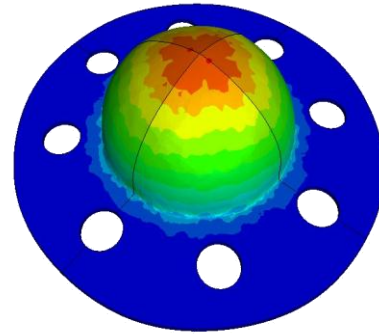
- Analysis of fluid – structure interaction
- Bespoke simulation of fluid engineering systems
- Cavitation prediction
- Coupled fluid dynamics and chemical reaction kinetics
- Crystallisation/precipitation/flocculation
- Fluid flow in complex geometries
- Oil/gas pipe network steady state and transient analysis
- 3 phase (liquid/solid/gas)
- Particle/droplet tracking and environment interaction
- Supercritical fluids and phase changes
- Thermodynamics
- Vapour cloud development

Materials

- Material and stress analysis with FE techniques
- Oil and gas permeation/ageing of seals
- Hysteresis in non-elastic seals
- Modelling and prediction of seals behaviour at high temperature and pressure

Further Analysis and Testing

- Non Linear FEA for polymer components – packers
- Seal failure consequence scenarios – leak rate/vapour cloud development
- HP/HT and cryogenic testing of components
- Materials testing
- Permeation and materials compatibility
- Valve emission testing



Stress in a clamped biaxial seal sample

Wear and Life Modelling and Testing

Predictive computer modelling, wear and life testing of:

- Polymeric/Elastomeric seals
- Decompression damage in elastomeric systems
- Bolted Joint Gasket and Packings
- Rotary seals including mechanical and lip designs
- Reciprocating Seals including nano-coatings
- Metal to metal seals

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