



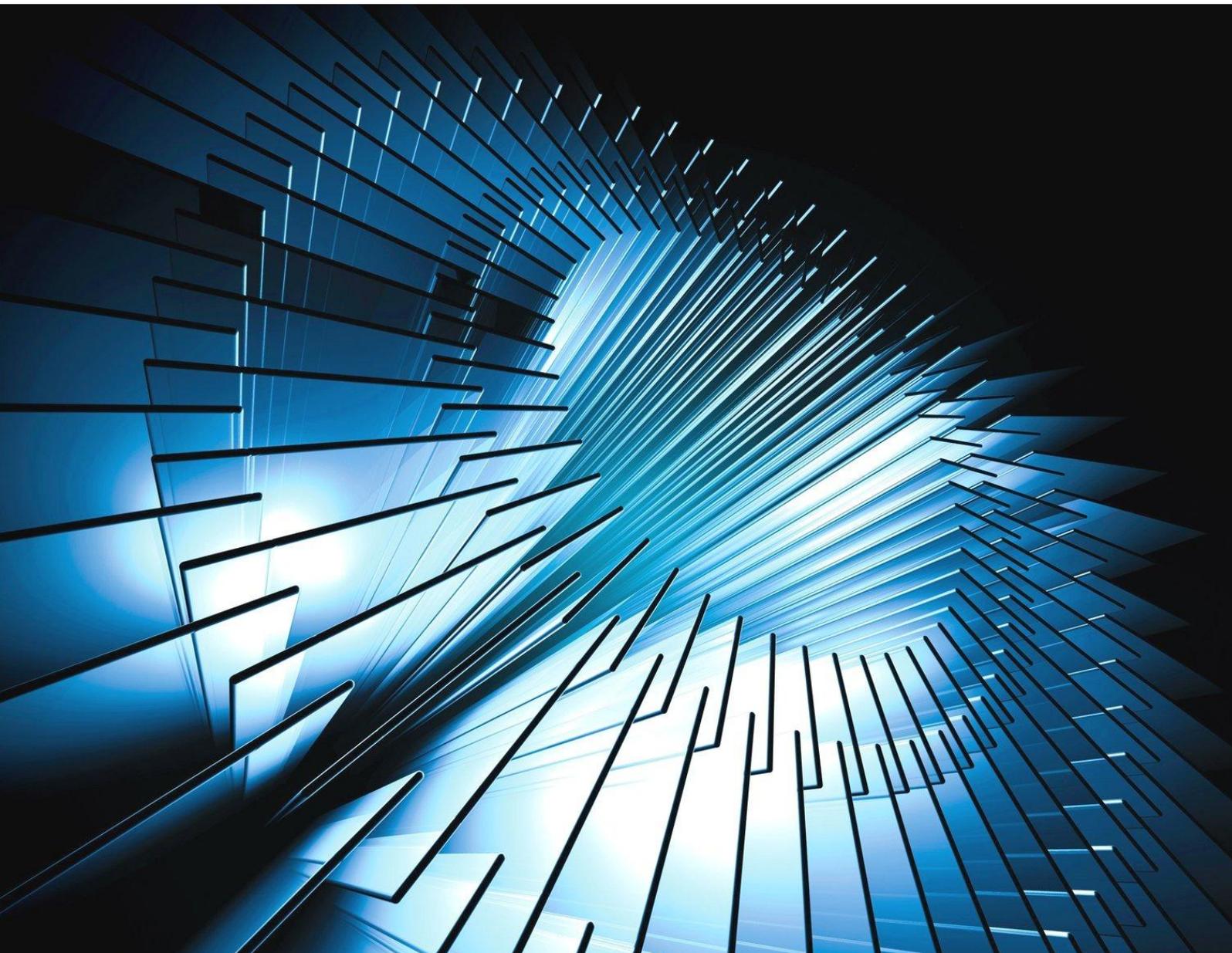
**BHR** Group

EXPERTS IN FLUID ENGINEERING

# Fluid Systems

## Service Overview

A guide to our services in high pressure fluid systems, sealing and materials





# Fluid Systems

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The Fluid Systems Division of BHR Group provides independent and impartial expert advice on the design and operation of high-pressure fluid power equipment and other hydraulic systems under critical conditions or in hazardous environments



## What We Do

We help our customers develop new designs and improve existing operations where the movement, containment and control of fluids under high pressure are critical.

We do this using professional engineers and technicians with a thorough knowledge of fluids. We use our expertise to solve complex engineering problems for a wide range of industrial sectors and environments.

We also realise that every project is different and has unique challenges and so we work closely with our customers to fully understand their needs so that we can tailor our services to meet their technical and business needs.

## Our Competencies

We develop and implement practical, cost effective and sustainable engineering solutions, based around our technical competencies in:

- friction, lubrication and wear
- sealing, containment and emissions
- functional materials and coatings
- fluid-material interactions
- fluid flow and assurance
- fluid power and fluid hydraulics
- high pressure engineering
- hydraulic cycling, stress and fatigue
- abrasive water jet-cutting and cleaning
- fluid borne noise and vibration



# Fluid Systems

## Engineering Consultancy

We provide both desk and site-based consultancy services covering the development, manufacture and performance of fluid systems products and processes.

Our services include:

- on-site engineering assessments
- design reviews and technical audits
- concept design development and assessment
- validation testing and/or numerical simulation
- development of engineering guidelines
- development of industrial best practices
- failure analysis and condition assessment
- in-house and on-site training.



## Qualification Testing

We maintain a number of dedicated test facilities that customers can hire. These facilities can be used or adapted for qualification and acceptance testing against international, industrial and company standards. We also develop test programmes for customers to deliver a tailored solution, while our independence assures that we provide impartial results.

Our services include testing, measurement, control and analysis of:

- liquid, gas, solid flows in pipes and components
- flow in pipes, pressure loss, friction, turbulence
- flow in control and metering devices

- fluid permeation or diffusion through materials
- pump, valve, actuator, fittings
- fluid and material contamination and degradation
- noise, vibration and cavitation
- high pressure and temperature components
- seal and sealing system integrity or leakage
- surface coatings and surface roughness
- proof, fatigue and burst pressure.



## Design, Modelling and Simulation

Proper understanding of the dynamics of any system being modelled, and the ability to abstract and simplify the associated problems, is a key feature when designing complex engineering systems. We take a multi-disciplinary approach and so can integrate the design process with computational or physical modelling and simulation.

Our services include:

- material and stress analysis including FEA
- fluid flow analysis including CFD
- pipeline pressure surge (waterhammer) analysis
- fluid structure interactions
- multiscale and molecular dynamics modelling
- bespoke modelling and simulation
- diffusion and permeation modelling in polymers
- thermal analysis of polymers, metals, alloys
- mechanical integrity assessment
- component and system performance assessment.



# Fluid Systems

## Industrial Research

We have a wide range of technical expertise, dedicated and customised test facilities and proprietary and in-house analytical tools so that we are able to provide quick answers to many technical challenges.

We work with individual customers or in collaboration with industrial sectors, and wider partnerships, to generate new knowledge for our mutual benefit. This can for example result in new or enhanced design or operating practices and testing standards, and early prototyping of novel products or processes.



Our research services include:

- contract research for customers with specific research needs
- consortium and Joint Industry Projects for those customers with generic research need - usually common to an industrial sector - and where pooling their financial resources creates a major research programme
- co-operative research services where diverse technical expertise is co-ordinated to develop and validate emerging technologies and ensure industry relevance and exploitation.

## Product Development

Our mechanical and process engineering design teams can optimise, enhance or model the design of new or existing products and processes. One of our strengths is that we can enhance our 3-D design capabilities with expertise from our research, mathematical modelling and prototype testing programmes. We can therefore cover the complete development cycle including concept, feasibility, definition, implementation, beta testing and deployment.

Our services include:

- concept design and optioneering
- concept and early prototype build and validation testing
- factory acceptance and qualification testing
- product and service support
- documentation and certification.



## What We Offer

- independent, impartial and confidential advice
- highly qualified and trained personnel
- a multidisciplinary approach to addressing complex engineering problems
- solutions adapted to customers needs
- access to a wider network of professional consultants, industrial and government experts
- a unique and comprehensive knowledge base of IP, reports, analysis methods and databases.

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