

# MANUFACTURE, ASSEMBLY & TEST

BUYERS GUIDE



# ENGINEERING MOMENTUM



Probe has been a trusted supply chain partner for engineering projects for over four decades. In this time, we have worked closely with our clients, building lasting relationships, to enable them to optimise asset productivity and performance.

Manufacturing oilfield equipment is at the core of the Probe offering. We are acutely aware of the demands and deadlines placed on our clients; so we are reliably responsive to their requests to ensure projects are delivered quickly but without compromising quality and safety. Our capabilities also extend to offer a full in-house assembly and test service for any manufactured item we make. Probe's systems are manufactured from our raw material stock, assembled according to industry standard requirements and tested by our highly qualified inspectors.

Our promise to you is always to find a solution to your engineering requirements, whilst delivering momentum to your project. The content of this buyer's guide explains how we can provide unrivalled results to your design, procurement, manufacture and quality assurance challenges.

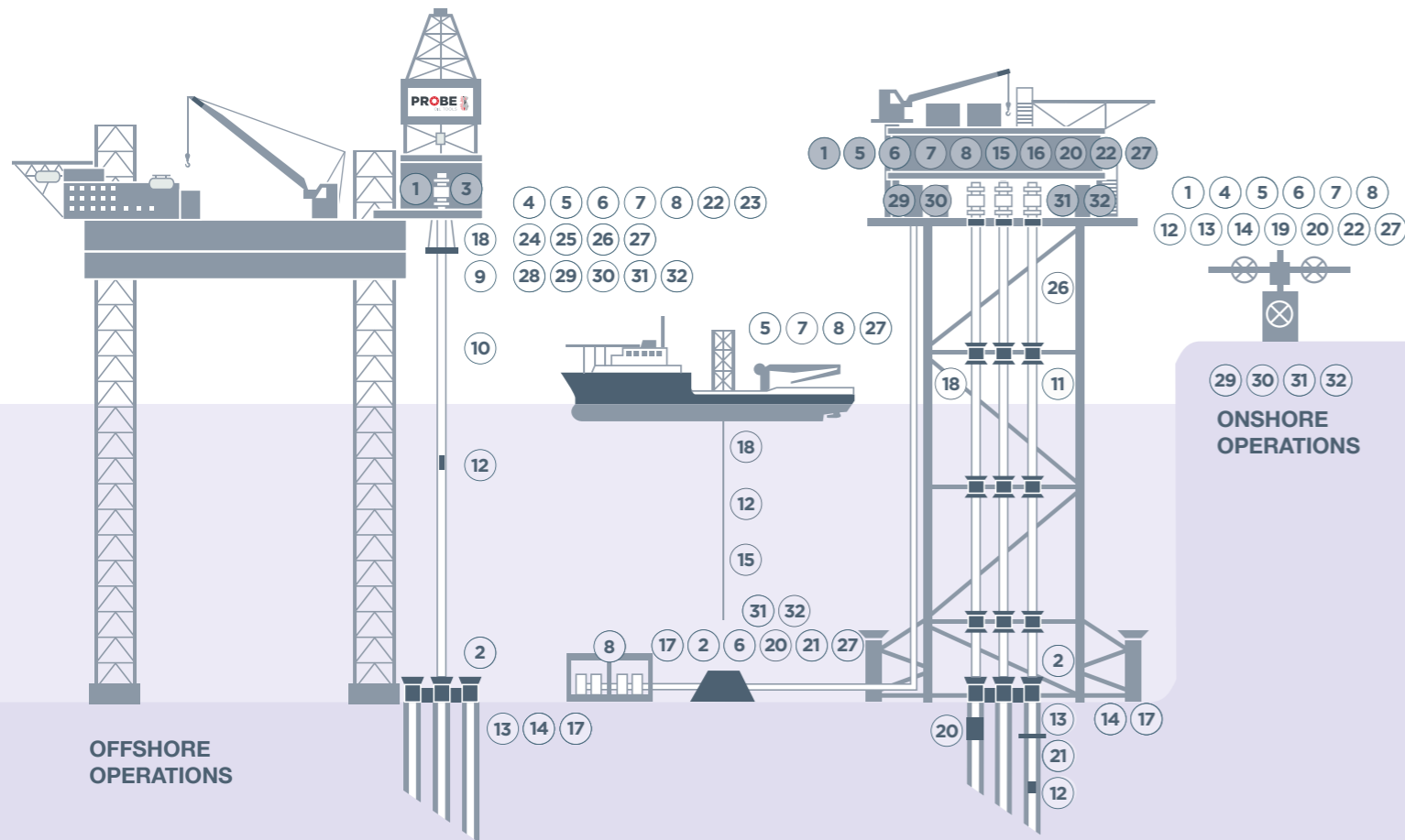
We have built a strong reputation for providing best-in-class solutions for service and supply companies across the oilfield industry. The Probe portfolio is continuously expanding as we also branch out to service other energy markets too. Our team of expert engineers are on hand to answer any questions or bespoke challenges you may have.

This is a very exciting time for Probe and we look forward to offering an innovative solution to your next engineering challenge very soon.

**David Brennan** Managing Director

# MANUFACTURE, ASSEMBLY & TEST

Oilfield service and supply companies are under increasing pressure to reduce costs whilst finding sustainable solutions to operator's ever-evolving needs. These companies need a manufacturing supply chain partner that they can trust to deliver within short lead-times, to the highest standard, time and time again.



- |                           |                      |                                        |                                           |
|---------------------------|----------------------|----------------------------------------|-------------------------------------------|
| ① Surface wellheads       | ⑨ Tension rings      | ⑰ Subsea offset adaptors               | ⑳ Tubing & casing crossover subs          |
| ② Subsea wellheads        | ⑩ Drilling riser     | ⑱ High pressure high temperature riser | ㉑ Pup joints                              |
| ③ Wear bushings           | ⑪ Marine riser       | ㉒ Frac head                            | ㉒ Lift subs                               |
| ④ Drilling spools         | ⑫ Flow control tools | ㉓ Instrument flange/test caps          | ㉓ Rotary connection repair                |
| ⑤ Surface trees           | ⑬ Casing hanger      | ㉔ Test plugs & running tools           | ㉔ Casing connection repair                |
| ⑥ Diverter spools         | ⑭ Tubing hanger      | ㉕ Chiksan pipe                         | ㉕ Tubing connection repair                |
| ⑦ Double studded adaptors | ⑮ Lubricator         | ㉖ Drifts                               | ㉖ Wellhead repair & maintenance           |
| ⑧ Choke & kill manifolds  | ⑯ Wellhead desander  | ㉗ Rotary crossover subs                | ㉗ Pressure equipment repair & maintenance |



Probe is not just a manufacturer of components; we have the in-house capability to assemble and test full systems. This buyer's guide gives an overview of the services that we can provide to meet the exact needs of our client's projects.

Our equipment production for the oilfield sector stretches back over 40 years. An early milestone was the purchase of our first CNC lathe in 1987 to provide us with the capacity to machine API and premium threads. Since then, our plant list has expanded extensively, and we have grown into one of the largest manufacturing supply chain partners in the East of England, with clients all over the world.

Our manufacture, assembly and test range of products includes wellhead systems, well intervention pressure control packages, marine safety and handling solutions and spreads. We have the capability to manufacture the individual components for all the systems we offer, whilst providing full equipment packages where required. This can provide savings to you, minimising inefficiencies and lead times.

Our stock held is generally more than 1,000 tonnes and we can therefore meet urgent delivery times from this holding. This stock is also all subject to receiving full inspections and we have state of the art in-house facilities to perform a variety of non-destructive testing including ultrasonic examination, magnetic particle inspection, liquid penetrant inspection and Brinell hardness testing.

To guarantee that our product systems meet the clients' requirements and specification, they are assembled and tested in-house. We work to the required test standard procedure stated by the end client. This is known as the factory acceptance test (FAT). Probe also offer hydrostatic pressure testing for manufactured and repaired parts up to 30,000psi with fully calibrated instruments and recorders. Our equipment packages are supplied with specific certifications which can all be accessed via our online portal.

Supporting our machining capabilities, we also have automated welding stations which allow us to provide a range of corrosion resistant claddings to our products. Applying cladding to components, as opposed to producing them in solid alloy, is a popular cost-saving choice for our clients, which allows them to maximise the life of their assets. Our computer controlled furnace ensures that post weld heat treatment of our products is compliant to our third party approved weld procedures.

Probe is licensed by the American Petroleum Institute (API) to manufacture and monogram products conforming to API specification 6A. The quality system is also audited and registered with API in accordance with API Q1. We are routinely audited both by external clients and internally to ensure we remain compliant with all relevant codes, specifications and regulations.

# WHAT IS YOUR CHALLENGE?

Whatever your challenge may be, we are confident that we can offer an unrivalled solution.

Our respected team is founded on engineering excellence and expertise in problem solving, devising innovative solutions and reducing complexity for design, procurement, manufacturing, and quality assurance (QA) challenges.



## What is your design challenge?

### Our in-house design capability

Probe have a dedicated in-house design team with many years of combined experience. Using the latest industry design software, we can work closely with our clients and manufacturing partners to ensure client owned intellectual property (IP) or our own designs meet with both needs, while delivering the work to industry standards.

### No challenge too difficult

A big challenge in design is making something which is manufacturable, and at the same time fits our customers' requirements. Along with 40+ years of experience, our in-house design team can draw from a library of drawings which also go back four decades to reference back to and help drive a qualified solution. If a requirement is outside our area of understanding, we can also draw on the expertise of our sister companies within the Acteon Group where required from across the globe to extend capability.

### Meeting industry safety codes and standards

Good Probe design and manufacturing processes are essential to ensure we meet technical and legal requirements. By definition, good design will also lead to safe design and this is something we pride ourselves on. While meeting our legal obligations is the minimum required, Probe always go that bit further and take best practice on board throughout the design process.

Whether it's using our clients IP or developing our own design work, this will also be sent to third party accreditors and verification organisations to seek approval against standards. If customers' requests and IP do not meet the standards required, we will advise on the most suitable course of action.



## What is your procurement and manufacturing challenge?

### Reducing costs and achieving savings for your project

Our key priority in achieving strategic cost reductions, is targeting resources where they can earn the best return. We find the correct approach to each job, to guarantee the most productive route through our machine shop. In a nutshell, it's finding ways to reduce costs through any means possible which in turn, importantly, saves money for our clients.

### Providing a holistic approach to a project

At Probe we focus on the 'entire' manufacturing process, bringing together both technology and human systems to identify and reduce production variability. Throughout any given project, it's increasingly important that our staff are trained to have a complete view of the processes, from the beginning to the end. This holistic philosophy has provided results that means guaranteed process improvements for our organisation that yields substantial cost savings for our clients.

### A supplier that can consistently deliver a quality product

Competitive quality, cost, service, and delivery have always been key requirements for our clients. It is a fundamental premise of Probe's manufacturing strategy that high-quality end products cannot be built cost effectively from low-quality components.

Probe have invested in a considerable stock of quality raw material. We stock AISI 4130 alloy steel, heat treated and tested to exceed the requirements of API 6A. Our stock of round bar ranges from 70mm to 1,200mm diameter, and square bar from 9" to 18" square. The stock held is generally more than 1,000 tonnes and therefore can meet urgent delivery times from this holding. All materials are also subject to receiving full inspections and we have state of the art in-house facilities to perform a variety of non-destructive testing.

### Determining the risk mitigation of projects

For senior responsible owners and buyers, it is important to engage with the marketplace in terms of identifying the desired outcomes, risks and issues of any project requirement. As part of project scope, Probe will provide feedback on how the outcomes to a requirement might be achieved, the risks and issues as we see them, along with feedback on timescales, feasibility and affordability. Effective management of risk helps Probe manage innovation and improve performance by contributing to increased certainty and fewer surprises for our clients along the way.



## What is your QA challenge?

### Health and safety procedures

Probe are utterly committed to undertaking our business in such a way as to minimise the risks of injury or ill-health to our people and damage to property. As part of our commitment to safety excellence, we have attained OHSAS 18001 certification.

### Quality assurance management systems

Ultimately, quality is about attention to detail and good communication - two things our clients regularly tell us we excel at.

Our philosophy of a responsive, practical service is at the heart of our approach to quality management. This is evident in the form of fast response and clear communication of clients' objectives and requirements and complemented by products of appropriate high quality, reliability, safety and cost effectiveness.

We have also implemented a formal Integrated Management System (IMS), and have gained certification to ISO 9001 - 2015.

### The manufacturing cycle

Controlling quality by utilising product inspections throughout the production cycle reduces risks and cost. At Probe, we carry out 'First Off' inspection procedures and 'In Process' quality control. We also schedule third party witness testing and verification checks if our clients request it and provide 100% dimensional inspection reports.

### Our commitment to the environment

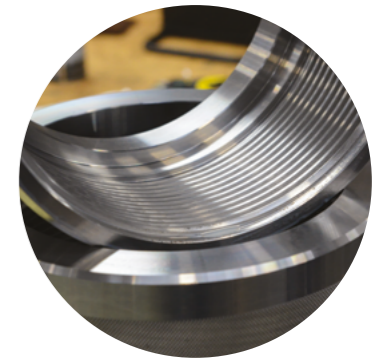
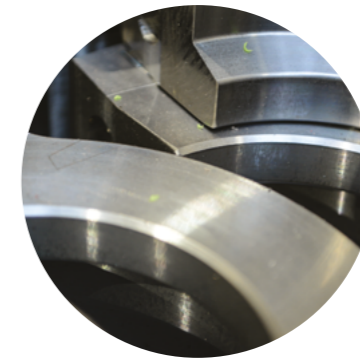
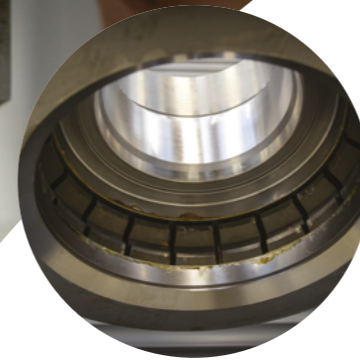
Here at Probe, we are committed to protecting the environment from avoidable harm. Within the Probe management system, we have incorporated the requirements of ISO 14001 and gained full certification. We believe our current business activities, and status of business development, constitute a limited environmental impact.

### Materials tested to meet specified requirements and standards

Probe's product testing has multiple applications, from determining if the specifications are being met to troubleshooting various issues that may arise. Using applicable industry related standards to measure the product's properties and performance, provides assurance of quality throughout the production process. For Probe, this provides a proactive strategy, that can avoid costly delays and rework down the line.

We are also licensed by the American Petroleum Institute (API) to manufacture and monogram products conforming to API Specification 6A. We also hold the prestigious API Q1 Certificate of Registration to verify that our quality system has been audited by the API.

Our Quality Management System is registered with DNV GL and we are registered with Bureau Veritas with a Certificate of Quality System Approval for the European Pressure Equipment Directive.



## Desander packages

Probe's desander packages allow the removal of sand from drilling fluid to prevent abrasion of pumps and associated spooling. We manufacture packages to the client's specific requirements. These can be mechanically operated or controlled by a fast-moving stream of fluid inside a special cone-shaped vessel. Our desander systems are made up of in-house manufactured components including spools, blocks and chambers and we offer a broad range of configurations to meet any application. Manufactured in compliance to API 6A 20th edition, Probe's desander components accommodate the complete range of API sizes and pressure ratings. Our desander equipment can be used in either standard or sour service applications.

## Marine safety and handling solutions

Probe is experienced in providing long-term solutions for the unpredictable, and often severe challenges, posed by operating in harsh marine environments. We provide marine handling systems to enhance the safety of offshore operations. Our bespoke systems are designed to the client's exact needs to enable mitigation against any unplanned events that could potentially cause harm to personnel or installations. All our safety and handling equipment is manufactured in compliance with current standards for marine operations.

## Wellheads

Probe offers a comprehensive range of wellhead systems for onshore and offshore applications. We take the individual manufactured components in our core service area, and fully assemble and test them to deliver complete wellhead packages. Probe can provide everything from wellhead flanges to tubing head adaptors. Manufactured to accommodate the full range of API sizes and pressure ratings, our wellhead systems are suitable for both standard and sour service applications.

## Well intervention - pressure control equipment

Throughout their life, wells will require parts maintenance, repair or replacement. Probe offers an extensive range of well intervention equipment to enable flow control projects to be carried out. All equipment is manufactured to current standards for well intervention operations and in accordance with API 6A 20th edition. Our well intervention packages can be adapted to suit either standard or sour service applications. All equipment packages allow service and renovation works to be carried out in a safe and efficient manner.

# CASE STUDY

## Innovative mooring connector solution

### The problem

The Minesto wave energy project in Holyhead Deep off the coast of North West Wales, is a novel application, which flies a “kite” subsea, generating electricity via a turbine mounted in the front of the device. The kite moves in a figure of eight on its side and through 180 degrees as the tide turns. The loads imparted to the seabed anchor connector are constantly varying in magnitude and direction, so the client approached Acteon’s sister company, SRP, to design a bespoke solution to counter these high stresses, based on their standard current connector technology.

Having worked on many innovative projects with SRP previously, Probe were the ideal partner to manufacture, assemble and test the complete connector.

### The solution

SRP offered a variant on their qualified subsea mooring connector, Rocksteady. The connector allowed the high vectoring loads to be transferred from the kite to the gravity base foundation.

To resist the extreme static and fatigue loads, the SRP connector generates a high preload between the mating halves of the connector to accommodate the bending, tension and shear loads applied.

SRP supplied a full set of design drawings, specifications and procedures, to allow Probe to manufacture, assemble and test the full system. To guarantee that our product systems meet the clients’ requirements and specifications, all these services are delivered in-house. This in-house capability provides savings to the client, minimises inefficiencies and lead times.

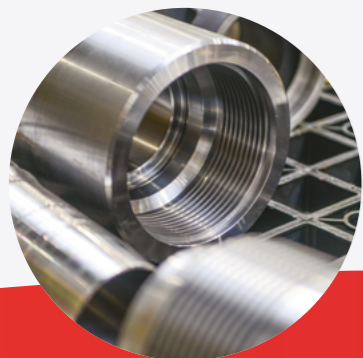
Marc Saiche, Sales Engineer, Probe, said, “Whilst working closely with the SRP engineers, Probe manufactured all components, and subsequently aided the SRP engineers to fully assemble and comprehensively test the mooring connector using our on-site machine centre and state of the art testing equipment. The factory acceptance testing (FAT) was witnessed by the end user, with excellent feedback and approval. I am delighted that we were able work collaboratively with our sister company on this project and feel we have produced potentially an industry leading product.”

### The result

For the end client, a successful solution to their high loading mooring requirement was achieved.

“Working alongside the Probe team enabled SRP to provide a solution that enabled our client to benefit from our collective experience and expertise. They received a full turnkey, project designed, manufactured and tested solution from the Acteon collaborative supply chain, in line with their expectations and timeframes. We now hope to cement our collaboration with Probe to provide a turnkey supply route for our Rocksteady range of mooring connectors moving forward.”

MARK HUDSON PROJECT MANAGER, SRP



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