PUMP SOLUTIONS IN THE OIL & GAS INDUSTRY API 610 RANGE
FOR WHERE IT REALLY MATTERS
THE HARSHEST ENVIRONMENTS DEMAND EXCEPTIONAL API PUMPS.

The Oil and Gas industry creates some of the most demanding scenarios for pump engineering. Environments are frequently remote and inhospitable. Unplanned downtime is not an option.

Diverse applications and product handling introduce unique pumping challenges. SPP Pumps Ltd’s ability to safely handle a wide range of fluids - often hazardous or toxic at potential extremes of temperature - comes from many years of proven pump technology.

Exceptional performance and proven reliability are pre-requisites. Whether through highly engineered packages or the more standard API products, SPP Pumps’ commitment to providing the best solutions to meet stringent customer specifications is second to none.

With experience borne from the harsh environments of the North Sea, you’ll find SPP pump equipment installed and operating in many onshore and offshore applications across the globe.

OIL AND GAS SECTOR APPLICATIONS
- Hydrocarbon and process pumps
- Cooling water
- Booster pumps
- Utilities
- Main fire pump
- Firewater jockey pump
- Seawater lift
- Seawater intake

SPP PUMPS PRODUCTS AND SOLUTIONS
- Overhung pumps
- Between bearing pumps
- Vertically suspended pumps
- Electro submersible pumps
- Generator sets
- Bespoke package solutions
SPP Pumps brought the UK's first ever North Sea Oil from the Argyll platform to our shores in the 1970's. Today, SPP Pumps' specialist design and engineering provides maximum uptime and performance across the world. With over 850 SPP Pumps systems operating in more than 140 fields and 700 installations, SPP Pumps expertise always delivers more...

EXCEPTIONAL PERFORMANCE: THE OPTIMUM PACKAGE FOR ANY APPLICATION
SPP Pumps' capability extends far beyond the design and manufacture of quality pumps. The company packages pump units into complete solutions. The result is finely tuned, bespoke-engineered units that precisely meet the performance specification each application requires.

EXCEPTIONAL VALUE: CUSTOM DESIGNED AND PROJECT MANAGED
From the initial client criteria through CAD drawing to final product installation, the SPP Pumps team works tirelessly to design and deliver integrated projects. Customised in-house design quickly solves customer application challenges, whilst experienced project management offers unparalleled added value.

EXCEPTIONAL RELIABILITY: PROVEN AND TESTED INTEGRITY - QUALITY ASSURED
In Oil and Gas applications, premature failure is simply not an option. Backed by one of the most extensive specialist testing facilities in the UK, every SPP Pumps manufacturing site is ISO 9001:2008 approved, with PD ISO/TS 29001:2007 approval for the Oil & Gas sector. Accreditations include ISO14001 (environmental) and ISO 18001 (H&S). SPP Pumps is also verified for Achilles, First Point Assessment Ltd (FPAL) and the Norwegian JQS. All pump packages comply with the latest industry regulations.

SPP Pumps operates R&D, manufacturing, test facilities and service sites in the UK, USA, India, France, South Africa, Dubai and Egypt, and local sales offices in Norway, Singapore, Italy, Poland, Holland and the Czech Republic. All SPP Pumps sites are ISO9001:2008, ISO14001:2004 and OHSAS 18001:2007 approved. The company also has ISO/ TS 29001 Certification, the quality management system (QMS) requirement for companies supplying to International Petroleum, Petrochemical and Natural Gas Industries.

Over 500 staff, including 50 specialist engineers, provide round-the-clock advice and support for performance-critical pumping operations, for some of the world’s largest organisations.
WHERE CAN SPP PUMPS’ PROVEN TECHNOLOGIES SUPPORT YOUR OPERATIONS?

TYPICAL PUMPING SOLUTIONS - OIL

1. Fire water
2. Sea water lift
3. Water injection
4. Oil Export
5. API Process
6. Non API
7. Utilities
8. Ballast/De-Ballast

TYPICAL PUMPING SOLUTIONS - GAS

1. Fire water
2. Sea water intake
3. Cooling Water
4. API Process
5. ANSI and ISO Chemical
6. Utilities
7. Pipeline/Booster

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WHERE CAN SPP PUMPS’ PROVEN TECHNOLOGIES SUPPORT YOUR OPERATIONS?
Experts estimate 1.4 trillion barrels of Oil equivalent lie in undeveloped Oil and Gas fields around the world.*

Let SPP Pumps support your operations in environmentally extreme and increasingly regulated environments.

SAFEGUARDING DURABILITY.
Certain operating environments may dictate the use of specific resistant materials. SPP Pumps’ API 610 products can be produced to comply with a variety of specialist standards, for example NACE for H₂S applications and NORSOK.

LIMITING NOISE: PUMP ENCLOSURES.
Depending on location, ambient pump noise levels may be a concern. Using advanced insulating materials, SPP Pumps’ special acoustic enclosures and shelters reduce operating noise to acceptable levels.

REDUCING RISK IN HAZARDOUS AREAS.
Sometimes pump packages may need to operate in an environment where hazardous gases may be present. SPP Pumps supplies equipment to meet the designated area classification (ATEX, NEC 500/505, IEC/CENELEC).

EASING INSTALLATION THROUGH PACKAGED SKIDS.
Where environmental conditions or location dictate that on-site installation works are minimal, SPP Pumps offers fully packaged skids or pump houses incorporating multiple pump sets.

*Source: “One trillion barrels – the global potential of undeveloped discoveries”, Wood Mackenzie, 12 September 2013

"29% OF OIL AND GAS OPERATORS POLLED BY DNV GL PLAN TO ENTER CHALLENGING AND POTENTIALLY HOSTILE NEW ENVIRONMENTS TO EXTRACT RESOURCES."*
Offering performance features specifically engineered for the rigours of petrochemical Oil & Gas applications, SPP Pumps’ API 610 latest edition pump range sets the standard for fully compliant design...

- Pump design life exceeds API 610 requirements
- Casing thickness can be designed to exceed API for enhanced life
- Bearing design life exceeds API standards, assured to at least 40,000 hours with continuous operation at rated condition
- Bearing housings equipped with high quality bearing isolators and magnetic drain plugs to prevent contamination
- Pumps designed with Stable head / flow characteristics
- Close radial running clearances between case and impeller wear rings for increased efficiency
- All radially split case pumps have metal to metal fit with confined controlled compression gaskets
- Shaft deflection at mechanical seal is below 50 μm under the most severe operating conditions thus improving seal reliability
- API 682 seal and seal systems ensure extended uninterrupted service life
- Condition monitoring options available
- Flexible Engineering team to accommodate client specific design requirements

SPP Pumps’ specialist Oil and Gas engineering team draws on over a century of experience solving demanding fluid handling challenges for diverse applications the world over.

Combining state-of-the-art analysis and modeling with in-house prototyping and manufacture, SPP Pumps is unique in its ability to design and deliver bespoke, fully integrated packaged pump solutions. Every SPP Pumps system is individually matched to a customer’s unique application and operating environment, utilising latest material technology including composite materials and manufacturing techniques, such as 3D printing of pump moulds.

COMPREHENSIVE TESTING BEFORE COMMISSIONING
Testing of all pumps takes place in SPP Pumps’ own flagship UK test facility. Rigorous performance testing, including ‘extended FAT’s’, can be witnessed by customers and third party inspectors. Boasting a six metre deep well, SPP Pumps can test high flow rates and pressures on site at either 50 or 60 Hz.

STREAMLINED PROJECT MANAGEMENT
Lost Oil or Gas production, even in a small facility, can cost an operation millions of pounds per day. Rigorous project management – and in particular close collaboration and communication with customers – ensures SPP Pumps solutions are optimally matched to the performance needs. The Oil & Gas Project Managers, all qualified PRINCE2 Practitioners, ensure a robust, consistent methodology across every project.

CUSTOM-ENGINEERED SYSTEMS, INDIVIDUALLY MATCHED.

PROVEN DESIGN FEATURES FOR SUPERIOR PERFORMANCE AND ENDURANCE.
SPP Pumps Engineering Services provides lifetime global support for all API products including spares supply, emergency repairs, planned contractual maintenance, product training and technical performance analysis.

An Oil & Gas qualified engineering team, fully versed in all current Health & Safety requirements, provides specialist installations and effects rapid response repairs. Spare parts, to OEM specification, are available from SPP Pumps service centres throughout a product’s lifecycle. Technical engineering capabilities, supporting performance improvement and lifecycle planning, include monitoring, pump testing and analysis using computational fluid dynamics.

SAFEGUARDING PRODUCTION CONTINUITY

When two platforms in the North Sea were forced to cease production, at a loss of £1.5 million per day, they turned to SPP Pumps’ expertise to resolve the emergency situation. Catastrophic failure of the caissons housing the pumps had damaged the pumps themselves. In just 10 weeks the team of highly skilled SPP Pumps engineers provided new pump and column assemblies to reinstall the units and get production restarted on the platforms. A project of this scale would normally take around 26 weeks to turn around, but the dedication of the team to resolve the issue as swiftly as possible saved the company millions of pounds in lost revenue.

*62% of respondents surveyed by DNV GL say they face growing pressure to extend the life of existing assets and increase the return on these investments*
## API PUMP RANGE

### OH2 / 3

**CONFIGURATION OH2 / 3:** HORIZONTAL AND VERTICAL, SINGLE STAGE, OVERHUNG

<table>
<thead>
<tr>
<th>Rating</th>
<th>Capacity @ BEP</th>
<th>Head</th>
<th>Temperature Range</th>
<th>Nozzle Orientation (Suction / Discharge)</th>
<th>Suction pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 2,000 m³/h (8,800 US gpm)</td>
<td>Up to 380 m (1,250 ft)</td>
<td>Up to 425 ºC</td>
<td>End-Top, Top-Top &amp; Side-Side when in OH3 configuration</td>
<td>Up to 80 bar (g)</td>
</tr>
</tbody>
</table>

**FEATURES**
- Low NPSH performance inducer also available for extreme conditions
- Water & steam jacket options available
- Reduced maintenance due to balanced axial thrust from both front and back casing & impeller wear-rings.
- Impellers are fitted with balance holes.
- Bearing lubrication by oil flinger as standard for OH2. Grease lubrication for vertical configurations. Oil mist retrofit connections will be provided for all models
- All main API materials of construction available, plus NACE and NORSOK requirements.

### BB1 / 2

**CONFIGURATION BB1:** HORIZONTAL OR VERTICAL, AXIALLY SPLIT, SINGLE & TWO STAGE, BETWEEN BEARING

<table>
<thead>
<tr>
<th>Rating</th>
<th>Capacity @ BEP</th>
<th>Head</th>
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<th>Nozzle Orientation (Suction / Discharge)</th>
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<tbody>
<tr>
<td></td>
<td>Up to 9,000 m³/h (39,600 US gpm)</td>
<td>Up to 320 m (1,700 ft)</td>
<td>Up to 135 ºC</td>
<td>Side-Side</td>
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**CONFIGURATION BB2 (SINGLE-STAGE):** HORIZONTAL, RADIALLY SPLIT, SINGLE STAGE, BETWEEN BEARING

<table>
<thead>
<tr>
<th>Rating</th>
<th>Capacity @ BEP</th>
<th>Head</th>
<th>Temperature Range</th>
<th>Nozzle Orientation (Suction / Discharge)</th>
<th>Suction Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 5,500 m³/h (24,200 US gpm)</td>
<td>Up to 550 m (1,800 ft)</td>
<td>Up to 425 ºC</td>
<td>Top-Top, Side-Top &amp; Side-Side</td>
<td>Up to 80 bar (g)</td>
</tr>
</tbody>
</table>

**CONFIGURATION BB2 (TWO-STAGE):** HORIZONTAL, RADIALLY SPLIT, TWO STAGE, BETWEEN BEARING

<table>
<thead>
<tr>
<th>Rating</th>
<th>Capacity @ BEP</th>
<th>Head</th>
<th>Temperature Range</th>
<th>Nozzle Orientation (Suction / Discharge)</th>
<th>Suction Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 1,500 m³/h (6,600 US gpm)</td>
<td>Up to 520 m (1,700 ft)</td>
<td>Up to 425 ºC</td>
<td>Top-Top, Side-Top &amp; Side-Side</td>
<td>Up to 80 bar (g)</td>
</tr>
</tbody>
</table>

**FEATURES**
- Package design and manufacture as per latest API 610 standard
- Centreline supported BB2 design to ensure high reliability under stringent operating conditions
- Single or double entry enclosed impellers for both one & two stage pumps.
- High efficiency product
- High NPSH performance
- Water jacket cooling, steam jacket, heat tracing and other options available
- Reduced maintenance due to balanced axial thrust
- Bearing lubrication by oil flinger. (Grease lubrication option available - BB1)
- Easy inspection and maintenance of bearings and mechanical seals following removal of coupling spacer
FEATURES

- Package design and manufacture as per latest API 610 standard
- Options available to prevent vapour leakage from sump
- Can be designed for various sump depths
- Low NPSH performance (inducer also available for extreme conditions)
- Thrust bearing lubrication options for grease or oil-mist
- Thrust bearing serviceable without removing discharge pipework

API PUMP RANGE VS4 / 5

CONFIGURATION VS4 / 5: VERTICALLY SUSPENDED, SINGLE STAGE, VOLUTE, SUMP PUMP

- Reduced maintenance due to balanced axial thrust from both front and back casing & impeller wear-rings. Impellers are fitted with balance holes.
- Perforated Suction Strainer available
- Material & lubrication options available for lineshaft bearings
- All main API materials of construction available, plus NACE and NORSOK requirements.

FEATURES

- Package design and manufacture as per latest API 610 standard
- Axial, mixed or radial type flow arrangements available
- Diffuser design for balanced radial loads
- Single or multi-shaft and column assembly for longer lengths
- Split and keyed inter-shaft coupling used
- Thrust bearing serviceable without removing discharge pipework
- Parts interchangeability between models
- Low NPSH performance with special suction impeller (inducer also available for extreme conditions – VS6)

API PUMP RANGE VS1 / 6

CONFIGURATION VS1:

VERTICALLY SUSPENDED, SINGLE OR MULTI-STAGE, LINESHAFT OR SUBMERSIBLE MOTOR

- Reduced maintenance due to balanced axial thrust from both front and back casing & impeller wear-rings. Impellers are fitted with balance holes.
- Perforated Suction Strainer available
- Material & lubrication options available for lineshaft bearings
- All main API materials of construction available, plus NACE and NORSOK requirements.

FEATURES

- Package design and manufacture as per latest API 610 standard
- Centreline supported design to ensure high reliability under stringent operating conditions
- Multistage, single entry, enclosed impellers (first stage double entry available)
- High efficiency
- Low NPSH performance with double entry impeller option
- Water jacket cooling, steam jacket and heat tracing options available
- Hydraulically balanced design
- Easy inspection and maintenance of bearings and mechanical seals following removal of coupling spacer

API PUMP RANGE BB3 / 5

CONFIGURATION BB3:

HORIZONTAL, AXIALLY SPLIT, MULTI STAGE, BETWEEN BEARING

- Ease of access to rotating assembly by axially split casing design (BB3), or removal of cartridge (BB5), assemblies can be removed without disconnecting suction and discharge pipework
- All main API materials of construction available, plus NACE and NORSOK requirements.

FEATURES

- Package design and manufacture as per latest API 610 standard
- Centreline supported design to ensure high reliability under stringent operating conditions
- Multistage, single entry, enclosed impellers (first stage double entry available)
- High efficiency
- Low NPSH performance with double entry impeller option
- Water jacket cooling, steam jacket and heat tracing options available
- Hydraulically balanced design
- Easy inspection and maintenance of bearings and mechanical seals following removal of coupling spacer

API PUMP RANGE BB5:

HORIZONTAL, MULTI STAGE, RADially SPLIT, BETWEEN BEARING, BARREL

- Ease of access to rotating assembly by axially split casing design (BB3), or removal of cartridge (BB5), assemblies can be removed without disconnecting suction and discharge pipework
- All main API materials of construction available, plus NACE and NORSOK requirements.

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- Package design and manufacture as per latest API 610 standard
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API PUMP RANGE BB3 / 5

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- All main API materials of construction available, plus NACE and NORSOK requirements.
To complete our extensive range of API 610 Pumps, SPP Pumps also offer Horizontal and Vertical pumps from our core product range.

**APPLICATIONS**
- Main fire pump
- Firewater jockey pump
- Booster pump
- Seawater intake
- Seawater lift
- Cooling water
- Utilities

**DESIGN FEATURES**
- Low NPSH* capability, high efficiency
- Balanced axial loads – maximum bearing life
- Removable top casing for easy maintenance
- Lowest life cycle cost through industry leading efficiency and rugged mechanical design

* Net Positive Suction Head

**OPTIONS AND DESIGN CONFIGURATIONS**
- Various construction materials to meet project requirements
- Custom engineering options
- Electric, Diesel or Hydraulic Drive
- Horizontal, vertical, direct coupled or vertical open shaft configuration
- Clockwise or counter clockwise rotation
- European or US flange drillings

**FIRE WATER AND SEA WATER SERVICE PUMPS**

Custom engineered Single or Multi-stage Vertical Turbines. Available with various Drive configuration.

- Lineshaft Driven by surface mounted electric Motor or Diesel Engine.
- Electro-submersible, with IP68 Submersible motor
- Hydraulic Motor Driven

**OPTIONS AND DESIGN CONFIGURATIONS**
- Flexible/stiff shaft
- Tilting pad or anti friction driver/gearbox mounted thrust bearings
- Special suction impellers
- Cast or fabricated column pipes
- API 610 construction
- Marine anti fouling systems
- Below deck discharge (for platform or jetty)
- Sacrificial anodes

**VERTICAL PUMPS**

For more information on SPP Pumps’ range of Fire Water and Sea Water Lift Pumps, please request a dedicated brochure.
## PUMP OFFERINGS

### APPLICATION MATRIX

**UPSTREAM**

<table>
<thead>
<tr>
<th>API Classification</th>
<th>Water Injection</th>
<th>Pipeline</th>
<th>Booster</th>
<th>Sea Water Lift</th>
<th>NFPA 20 Fire Pump</th>
<th>Others</th>
<th>Charge</th>
<th>Process Transfer</th>
<th>Bottom</th>
<th>Propane/Butane/LPG Handling</th>
<th>Diesel Oil/Gasoline/Naphtha/Lube Oils etc</th>
<th>Sodium Carbonate</th>
<th>MEA/DEA/TEA (Stock &amp; Lean Solution)</th>
<th>Power Recovery</th>
<th>Others</th>
<th>Desalination</th>
<th>Water Treatment</th>
<th>Descaling</th>
<th>Mining</th>
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<tbody>
<tr>
<td>OH2/3</td>
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**MIDSTREAM & DOWNSTREAM**

### HIGH PRESSURE WATER

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