Offshore Pipeline Packages
Your partner in the global search for energy
YOUR PARTNER IN OFFSHORE PIPELINE SOLUTIONS

Capitalising on decades of experience, our expert knowledge of steel and our global capabilities, we will work together with you to provide the optimum offshore pipeline solution, whatever your requirements.

As leaders in the deepwater linepipe market, we have worked extensively and closely with our customers on complex and often time-critical projects, delivering products that are proving themselves in the world’s harshest environments.

Today, our high performance product portfolio includes welded linepipe, pipe-in-pipe, ancillaries and special coatings for deepwater and high-temperature applications. This wide product range enables us to fulfill all your linepipe requirements, therefore reducing your contract complexity.

By working with us you can be assured of optimal pipeline properties. Fit up and lay rates can both be dramatically improved due to the superior tolerance control delivered by our quality pipe manufacturing processes.

As part of a global network with a well-established reputation for providing value in steel, we work with in-country sub-contractors to deliver local content. Our network of offices provides local knowledge and support in oil and gas producing territories around the world.

We are committed to working in partnership with our customers and industry experts in the continuing quest to deliver high-performance products that lead the way in the recovery of hydrocarbons. Our product solutions enable you to develop deepwater and high-pressure, high-temperature well resources that would otherwise be uneconomical.

Our products are proving themselves in the world’s harshest environments.
We understand the pressures facing today’s pipeline operators and contractors. We employ expertise and innovation to meet challenges head-on and to deliver solutions for a wide array of demanding operational scenarios.

Challenge
As the worldwide demand for energy continues to grow, there is increasing pressure to exploit hydrocarbons in ever more remote and harsh environments. Both operating and capital expenditure are on the increase as attention focuses on deepwater and remote fields. Linepipe performance and reliability have become a critical cost factor. Pipeline operators and contractors are turning to proven suppliers to work with them in partnership as they tackle current and future challenges.

Technology
Extreme challenges demand strong solutions. Our unique capability in thick-walled linepipe ensures that Tata Steel is an ideal partner for deepwater projects. We are applying an array of process and material technologies to extend our capabilities and to enhance linepipe performance to meet emerging needs. Collapse resistance, flow assurance and corrosion management are high on the agenda for the continuing development of our wide range of pipeline solutions.

Innovation
We are leading the way in the supply of innovative pipeline solutions.

Our pipe-in-pipe products already operate in some of the most challenging subsea applications and environments. Innovations include a hybrid insulation pipe-in-pipe system for improved strength and thermal performance, delivering assured flow rates in high temperature applications. Our proven range of external coatings is being expanded to exploit advances in multi-layer foam-coat technology, offering an even wider range of thermal insulation level options to our customers.

We have also developed a cost-effective, metallurgically-bonded clad linepipe that is highly corrosion-resistant ensuring long service even when transporting sour gas over large distances or within riser systems.
Offshore Pipeline Packages: Your partner in the global search for energy

Our products are proving themselves in tough environments. Strength, reliability and innovation are the hallmarks of our pipeline solutions.

Our pipeline products have been developed to perform in a wide range of demanding application scenarios. From recovery in deep water and remote fields to the transportation of highly corrosive resources, our pipeline offers a comprehensive choice of solutions to meet specific and exacting requirements. Our products are installed and delivering in numerous locations including the UK Continental Shelf, the Gulf of Mexico and West Africa.

**Advantages**

Our unique capability in thick-walled pipe – combined with our trademark tight tolerances – means our linepipe offers significant advantages to today’s pioneering operators. These include easy fit-up and faster lay rates, improved collapse performance and fatigue resistance in the harshest conditions.

Our fundamental product strengths are augmented by the innovative application of materials technology for enhanced flow assurance and corrosion management. Special coatings, pipe-in-pipe solutions and metallurgically-bonded clad linepipe can be supplied to meet discreet requirements or as part of a complete operating system.

Our technical expertise and industry knowledge mean we are perfectly placed to procure and manage a wide range of pipeline-related components and systems that complement our own production capabilities. By contracting us as your single source of pipeline product packages you can benefit from contract efficiencies and reduced contract risk.

Full details of the sizes, properties and performance capability of our wide range of products is available at www.tatasteelenergy.com

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<thead>
<tr>
<th>Application</th>
<th>Solution</th>
<th>Description</th>
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<tr>
<td>Deepwater</td>
<td>Collapse-resistant linepipe</td>
<td>We have a solid track record in the production of thick-walled Double</td>
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<td>Submerged Arc Welded (DSAW) linepipe, even in smaller diameters. Our capability</td>
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<td>is combined with a thorough understanding of the mechanisms driving deepwater</td>
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<td>collapse. Through optimising the wall thickness tolerance and quality of our</td>
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<td>linepipe we enable our customers to reduce the wall thickness of their pipeline</td>
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<td>design, lowering the submerged weight of the pipeline and reducing fit-up and</td>
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<td>welding costs during pipeline.</td>
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<td>Internal corrosion management</td>
<td>Sour-resistant steels</td>
<td>We have extensive experience and expertise in the selection and utilisation of</td>
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<td>Metallurgically-bonded clad pipe</td>
<td>our sour-resistant steel for pipelines transporting highly corrosive hydrocarbon</td>
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<td>products. Our metallurgically-bonded clad linepipe is formed from carbon steel</td>
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<td>and Corrosion-Resistant Alloy (CRA) metallurgically-bonded plate to provide a</td>
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<td>highly corrosion-resistant internal pipe surface without the expense of a solid</td>
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<td>CRA pipe. This product can be economically manufactured in large quantities</td>
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<td>making it ideal for the longer lengths required for offshore developments and</td>
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<td>our systems.</td>
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<td>External corrosion management</td>
<td>3-layer polyethylene and fusion</td>
<td>We offer a range of external coatings including FBE (with corrosion resistance</td>
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<tr>
<td></td>
<td>bonded epoxy (FBE) coatings</td>
<td>from -40°C to 85°C) and 3-layer polyethylene or polypropylene (with resistance</td>
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<td></td>
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<td>up to 110°C). We can apply these coatings at our mill site through our joint</td>
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<td>Wet insulation – PP foam</td>
<td>venture operation. Alternatively, we can manage the coating service through one of</td>
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<td>our many partners worldwide.</td>
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<tr>
<td>Oil offloading lines / steel</td>
<td>Fatigue-resistant linepipe</td>
<td>For applications where lower insulation properties are required, we offer a 4-layer</td>
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<td>catenary risers</td>
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<td>polyethylene system for maintaining flow assurance.</td>
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<td>Enhanced recovery</td>
<td>HFI linepipe</td>
<td>Where injection lines are required for enhanced recovery, we offer High</td>
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<td>Remote fields and long tiebacks</td>
<td>Weldable linepipe</td>
<td>Frequency Induction (HFI) welded products with much reduced lead times</td>
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<td>Offshore (varying scenarios)</td>
<td>Pipe-in-pipe</td>
<td>compared to traditional alternatives.</td>
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<td>We have worldwide experience of subsea pipelines operating in a variety of</td>
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<td>conditions and water depths. We can offer excellent low and high temperature</td>
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<td>pipe properties together with our renowned, tight dimensional properties –</td>
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<td>reducing costs and lay times.</td>
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**PRODUCTS THAT PERFORM**

Our pipeline products can reduce project installation costs through short lay times and faster fit up.

**Tata Steel – Pipeline Solutions**
Our manufacturing operations are geared to the production of a wide range of high-performance, proven linepipe – enabling customers to optimise their pipeline developments.

Proven and flexible
Our world-leading mills, producing both Double Submerged Arc Welded (DSAW) and High Frequency Induction (HFI) welded linepipe, occupy sites at Hartlepool in the north-east of England and Corby in central England. Our DSAW mills boast the world’s most powerful crimp and ‘O’ press. Our HFI mill employs the most powerful HFI welder in the world (1800kW). We operate multi-process production routes, with specialist coating and pipe-in-pipe facilities co-located with our mills to ensure speed, efficiency, flexibility and control, enabling us to meet the needs of your project, however complex and time critical.

Performance benefits
We combine expert knowledge of steel chemistry with advanced processes to deliver products with outstanding performance characteristics including strength and fatigue-resistance. We have impressed customers worldwide with our ability to achieve excellent pipe form and dimensional tolerances. This enables accurate pipeline system design – eliminating waste and reducing costs.

Continuing investment
We are committed to the continuous improvement of our processes in order to enhance our products and maintain the quality of our manufacturing capabilities. More than £25 million has been invested over the last five years to keep all of our mills at the leading edge of pipe-making technology. There have been several extensive upgrades to our HFI mill and recent improvements at our DSAW mills have included enhancements to tack welding machines and our crimp press for faster throughput. New plate edge milling and bevelling machines are enabling pipe welding to the highest standard.

Stringent testing
Among the millions of pounds that we have invested in recent years, a significant proportion has been spent on ensuring that our product testing facilities are second to none. We have installed pioneering 28-probe non-destructive testing systems to provide complete confidence in weld integrity. Ultrasonic examination of the seam weld, transverse weld tensile testing and x-radiography of the weld are undertaken to complement a battery of other tests and inspections for plate, welds and finished pipes. These include hydrotreated and hydrotamatic testing and magnetic particle inspection for your complete product assurance.
Deepwater pipelines in the USA

Challenge: The deep waters of the Gulf of Mexico demand exceptional collapse performance. As operators push the boundaries of exploration to access greater depths, concerns about infrastructure become a critical consideration.

Solution: Expertise in thick-walled pipe has meant that we were able to rise to the challenge posed by deep water and rugged seabeds. We supplied the flange for the Total BHP project with 86 inches of 18 inch outside diameter (OD) linepipe which was reel laid at depths of 6,000 feet – making it the largest diameter pipe ever to be reel laid in the world. Since this achievement we have supplied pipe for an extensive list of challenging, deepwater projects in the same region including Devil’s Tower, Tahiti and for an extensive list of challenging, deepwater projects.

Our pipeline solutions are in service all over the world. Offering outstanding performance and reliability, our product range can be deployed with confidence. In addition to boosting the local economy, this new facility will have a major influence on the growing potential for deeperwater and ultra-deeperwater projects whilst also allowing us to respond quickly to the requirements of our customers in West Africa. With more projects located offshore, at ever increasing water depths, concerns about infrastructure development and security issues continue to highlight the need for companies such as ours that are willing and able to collaborate and co-operate with local business leaders and communities.

Sour service in Indonesia

Challenge: Total E & P Indonesia planned to extract extremely sour resources from the Sea of Sipin offshore fields. They needed a linepipe supplier with proven experience of sour service pipelines.

Solution: Our thick-walled OD A linepipe for sour service had been proven on numerous projects including the supply of 10 km of 22 inch and 26 inch thick-walled material to Total E & P Indonesia. As part of our service to supply complete solutions, we also managed the supply of mother pipe and procurement of hot induction bends, reducing contract complexity for our customer. The key success factor on the project was the blend and application of steel and linepipe technology to produce optimum sour resistance. The pipeline was brought into service in 10 km lengths with a 16 inch OD A linepipe from the offshore fields to the largest liquid natural gas (LNG) liquefaction plant in the world at Bontang on Kalimantan Island.

Our work with the Cabinda Gulf Oil Company (a Chevron affiliate) in Angola was a case in point.

Flow assurance in the North Sea

Challenge: The recovery of high temperature oil and gas from the North Sea has demanded exceptional pip-in-pipe performance. The BP Rhum field, Talsnæs Trendmor and Shell Starling developments all required production lines with excellent overall heat transfer coefficients. U values of less than 1 W/m2K. Rapid lay rates were also demanded to ensure economical installation.

Solution: We have supplied more than 200km of pipe-in-pipe, operating at temperatures up to 125°C. The pipeline systems used inner and outer carbon steel pipes, the outer pipes often with CRA liners. The joints were installed using polyurethane foam, the accuracy of assembly and concentricity and its length allowed lay rates of up to 1,000 meters per day through the management of approved sub-contractors. We were able to reduce supply chain risk and complexity, supplying pipe materials, coating and pipe-in-pipe assembly. The completed pipe-in-pipe joints were loaded out from our deepwater port at Hartlepool on a 24 hour basis straight to the S Logo vessel.

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Oil offloading in West Africa

Challenge: High oil and gas prices mean national and independent operators are seeking to bring developments into production faster. On the Tullow Oil Horne and Wren development, project schedules were at risk due to the lead times for a 2” inch chemical injection line.

Solution: We responded with a ‘quick to market’ small diameter linepipe from our HFI mill in Corby. This product was designed into the development, allowing the rest of the project to proceed on schedule. Through our knowledge of the offshore sector and the steel industry we were able to ensure that the offering met the customer’s requirements with a product that was available to the tightest of timescales. Since supplying the Tullow Horne and Wren development, we have completed similar projects for Nexstep Petroleum and Shell/NAM.

Rapid field development in the North Sea

Challenge: Operators are seeking to bring developments into production faster. On the Tullow Oil Horne and Wren development, project schedules were at risk due to the lead times for a small diameter chemical injection line.

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Concrete weight coating in Angola

Challenge: The successful recovery of resources from emerging ‘hotspots’ can rely heavily on the establishment of strong, in-country partnerships. Our work with the Cabinda Gulf Oil Company (a Chevron affiliate) in Angola was a case in point.

Solution: As part of our agreement to supply linepipe, we contracted SooNorth Angola Ltd to operate the first concrete weight coating facility in Luanda. Staffed by local people, the facility was designed to cater for 4-in 45inch (inside diameter) pipes. In addition to boosting the local economy, this new facility will have a major influence on the growing potential for deeper water projects whilst also allowing us to respond quickly to the requirements of our customers in West Africa. With more projects located offshore, at ever increasing water depths, concerns about infrastructure development and security issues continue to highlight the need for companies such as ours that are willing and able to collaborate and co-operate with local business leaders and communities.
EVERY STEP OF THE WAY

From front end engineering, through production, delivery and support, our team is there to take the load, share the risk and save you time.

Our people are knowledgeable and offer solid support and advice borne from significant experience of the steel, coatings and hydrocarbons industries. We work in careful, considered partnership with our customers, sharing our expertise and delivering solutions on time and to budget. We encourage customers to make full use of our experienced personnel who will plan and co-ordinate all aspects of delivery from supply of our mill products through to the procurement of sourced items and the provision of support.

We offer a broad service – embracing all aspects of logistic support – but we tailor our efforts to match client requirements. Our flexible approach is matched by the flexibility of our production facilities, where optional processes, from heat treatment to the application of special coatings, can be accommodated. Through our joint venture, BSR Pipeline Services, we can offer our own on-site coating service or undertake coating locally to customer projects. We work with operators, lay contractors and pipeline engineers to supply single item purchases through to complex, integrated solutions, removing supply chain complexities.

Global access
Our Hartlepool pipe mills and coating facility are located close to deep water ports, providing ready access to all parts of the world.

The Tata Steel network of over 50 offices worldwide also helps to smooth the way through provision of valuable local knowledge and assistance. Major offshore hubs in London, Houston, Singapore, Perth and Dubai provide a secure environment for the direction and control of our global supply chain management operations.

Depth and breadth
Pipeline from Tata Steel offers a range of proven products and complete systems to all sectors of the energy industry. In addition to the linepipe and ancillaries developed for offshore and harsh operating conditions, we have significant experience in the provision of linepipe for the onshore gas and water industries. We also supply an extensive selection of process pipe and Oil Country Tubular Goods (OCTG). Full details of these products and associated services can be obtained by contacting our sales team on energyprojects@tatasteel.com.

Our customer support service offers:
- full range of logistic support
- inspection
- technical support
- precise order of delivery
- offloading and stacking

Offshore Pipeline Packages Your partner in the global search for energy
FOCUS ON THE FUTURE

As the pressure mounts to recover energy resources, you can rely on us to stay focused on success through innovation.

We continue to expand our industry knowledge, exploit our experience and invest in technology to ensure that our pipeline solutions are geared to current and future needs.

We are committed to contributing to the ongoing success of our clients’ pipeline operations through

Pioneering Products
We are a world leader in the supply of DSAW deepwater pipelines, high integrity HFI pipe and innovative solutions for field exploitation.

Proven Processes
Our production processes are second to none and our extensive track record includes some of the most technically challenging offshore projects in the world.

Productive Partnerships
In which projects collaboration and partnership can only be achieved with close interaction with our customers as they explore new markets and expand pipeline operations in increasingly challenging environments.

Sales office
- Monterrey, Mexico
- Rio de Janeiro, Brazil
- Chicago, USA
- Lagos, Nigeria
- Copenhagen, Denmark
- Paris, France
- Milan, Italy
- Dubai, UAE
- Abu Dhabi, UAE
- Kuala Lumpur, Malaysia
- Singapore
- Beijing, China
- Shanghai, China
- Melbourne, Australia

Manufacturing location
- Hartlepool, UK
- Corby, UK

Locations worldwide demonstrate the global reach of Tata Steel