



EUROPIPE

Products for the oil and gas industry

EUROPIPE. Full of energy.



EUROPIPE: Thinking ahead.

A third time around the world.



In 1804, the Dillinger Hütte steel mill rolls its first steel plate. In 1845, a company later to become part of Mannesmannröhren-Werke produces Europe's first welded steel pipe. In 1991, these two steel industry pioneers pool their expertise and join forces to create EUROPIPE, soon to emerge as a global leader in the pipeline industry.

Supplying products and services for pipeline construction, EUROPIPE today leads an industry that takes thinking big literally.

A 1.5 million kilometre network of pipelines spans the globe, conveying gases and liquids with maximum safety and the utmost respect for the environment. For this market, we produce worldwide over a million tonnes (around 3,000 kilometres) of large-diameter steel pipe every year – for use throughout the world: over land and under water, in the Arctic ice and in the desert heat.

Our success is based on a simple principle: thinking ahead. Each and every one of our employees is committed to the philosophy of anticipating customer needs to make our products, processes and services even better.

The ability to think ahead – this is the pledge of top performance with which we approach every challenge. Over the years EUROPIPE and its predecessors have manufactured over 30 million tonnes of large-diameter pipe, enough to circle the world twice. Now the third lap has begun, with metre after metre of pipe in a quality that is the benchmark for the world.

Water, ice and sand.

To get through the desert, you have to be tough.

Through deserts of sand, ice or water: Wherever gas or oil needs to be transported cost-effectively, people rely on EUROPIPE know-how. Our wide range of dimensions and materials guarantees products that are perfectly

tailored to customer requirements. Our pipes are manufactured in accordance with national or international standards (API, EN, ISO) and specifications (NACE, DNV and others), as well as taking customer specifications into account.

For our pipes, we develop materials of the highest quality. Larger pipes designed for high operating pressures require high strength levels to minimize wall thickness and pipe weight. To meet the need for both high strength and

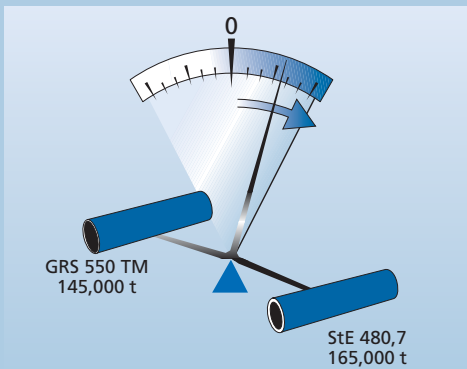


- ① Onshore pipe laying
- ② Burst test X 100
- ③ Collapse test

enhanced toughness, we use steels with particularly fine-grained microstructures. These ferritic-bainitic or pure bainitic microstructures are obtained by thermomechanical rolling with additional cooling.

All materials up to and including X 80 are proven over the entire range of wall thicknesses and have demonstrated their performance capabilities for many years in applications across the globe.

Werne to Schlüchtern pipeline, 100 bar,
48" x 18.3 mm wt, 250 km, GRS 550 TM



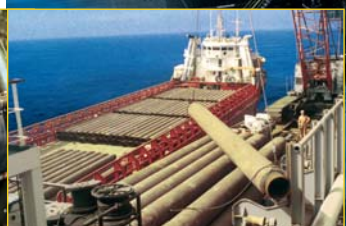
Nature puts on the pressure.

The depths to which steel can sink.

At 1,000 metres below sea level, the pressure is enough to punish even the smallest of production errors in the blink of an eye: the pipe collapses. Our heavy walled pipes, with relatively small diameter-to-wall-thickness ratios, are proven to withstand depths of up to 3,500 metres without buckling.

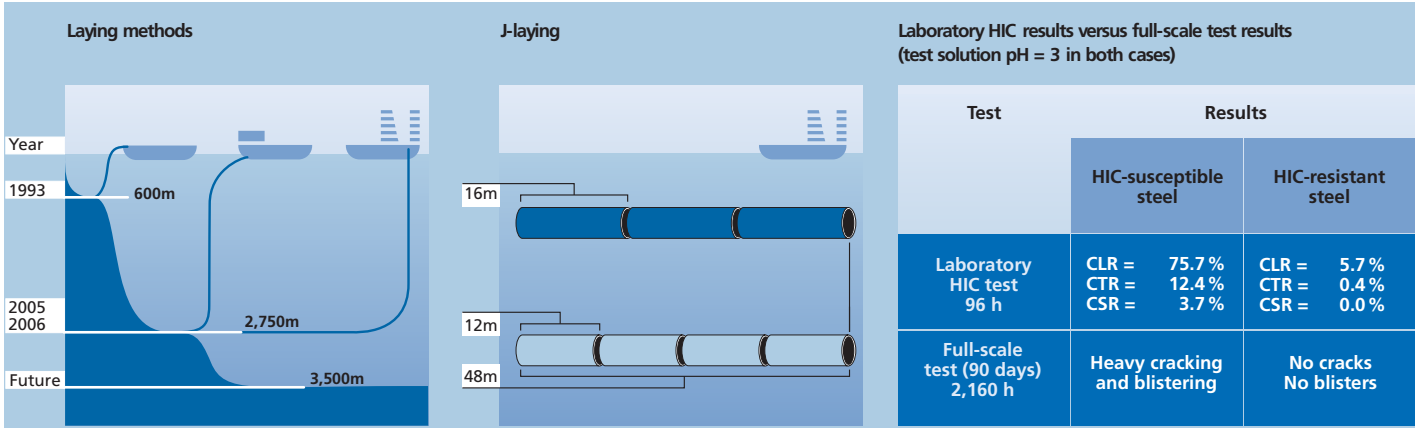
In extensive component tests, we have succeeded in quantifying the parameters affecting collapse-resistance. As a result, we place stringent demands on pipe geometry and uniformity of mechanical properties. EUROPIPE has delivered pipes up to 24" ID x 41 mm W.T. in grade X 70 with high strength and toughness in both base metal and seam. As well as customary offshore lengths of up to 12.5 m, EUROPIPE offers pipes up to 18.3 m (60 ft) long, for cost-effective installation.

Another challenge our materials have to meet is the transportation of sour gas and sour oil. Here, steels are needed which display adequate resistance to hydrogen-induced and stress corrosion cracking, with low carbon contents between 0.03 and 0.05 % and a high degree of cleanness. Sulphur, for example, is reduced to levels below 0.002 %.



We achieve a particularly homogeneous, fine-grained microstructure and optimal strength and toughness properties by means of thermomechanical rolling with accelerated cooling.

To date, EUROPIPE has supplied more than 2 million tonnes of large-diameter pipes for sour gas service: In X 65 up to 35 mm W.T. and X 70 up to 25 mm W.T. for tests in pH3 and pH5 solutions.



Tested to collapse.

Tolerance has its limits.

As easy-going as they may be in their private lives, as soon as our R&D engineers put on their white coats every morning, any thoughts of tolerance go out the window. All our new and further developments are subjected to uncompromising full-scale testing.

High Strength Steel

Grade X 80 line pipe is now considered an established technology for onshore pipelines. But economical transport over long distances requires additional cost reductions.

Grade X 100 and/or X 120 could be a solution. Since the first production runs of X 100 line pipe, manufacturing parameters have been optimised to find the best balance of strength, toughness, deformability and weldability. For cases where pipe body CVN tough-



ness is insufficient to ensure crack arrest, crack arrestors have been developed and have proven to be a viable alternative. Grade X 100 pipes with wall thickness up to 25 mm have been produced, and initial results of development work on grade X 120 are encouraging with respect to base material properties, weldability and forming.

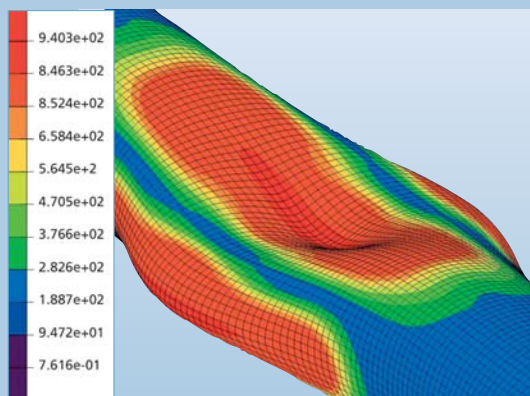
Heavy-walled pipes

We are continuously optimising the property profiles of our steels for deep-sea use. Our plate suppliers have to achieve uniform mechanical properties and good DWT transition temperatures, while our pipe mills are constantly working to improve weld and HAZ toughness. We carry out additional testing to confirm collapse resistance.

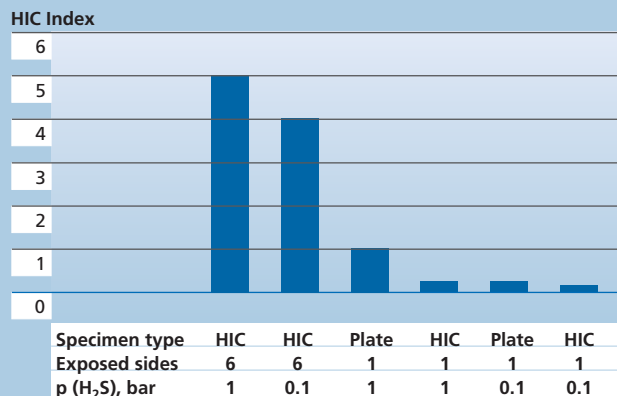
Sour gas service pipes

Pipes for sour gas service are tailored individually to each application. Whatever the requirements, from high H₂S to slightly sour, we always achieve the best property combinations. Another area of successful research and delivery with the optimisation of X 70 pipes in wall thicknesses above 25 mm.

Collapse simulation using finite element method



HIC behaviour of grade X 65 steel designed for „slightly sour service“



Hot and cold.

Going the extra mile.

A wide range of standard products tells you a lot about a manufacturer's capabilities. But the true test is when it comes to developing special products for extreme applications.

EUROPIPE has repeatedly excelled in this respect, whether producing large-diameter pipes for arctic service or manufacturing pipes for conveying hot pressurised steam – an area where we have even been known to use X 80 steels. We are currently conducting intensive work on the production of metallurgically bonded clad pipes to transport particularly corrosive fluids.

Working closely with partner companies and sub-suppliers, we also make conductor pipes, buckle arrestors, pipe bends but also structural pipe and piling.

Together with our customers, we have mastered every challenge to date. And we intend to keep it that way.





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