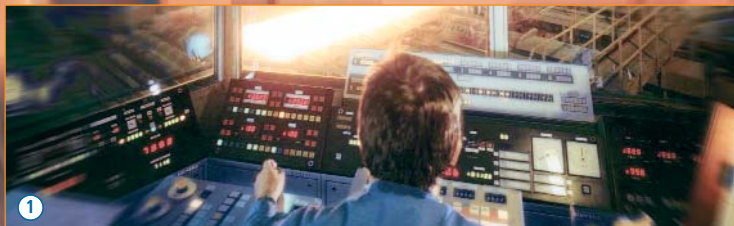


Pre-material for large-diameter pipe



① Steering stand of the rolling stand

② Accelerated cooling of plate

③ Visual inspection of plate surface

EUROPIPE: Thinking ahead.

Efficiency – right down the line.



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. And it is good to know our partners in production take the same approach.



4



A promise as strong as our pipe.

For our partners, only the best ingredients will do.

Just as human characteristics are largely controlled by our genes, so the quality of steel pipe is predetermined by the material that goes into making it. That is why EUROPIPE makes sure its suppliers' steel plants meet the very highest quality standards. Only exceptionally clean, high-strength low-alloy steels with low carbon contents will do. After hot metal desulphurisation, the steel is made by the top-blown oxygen process. This is followed by ladle metallurgy – further desulphurisation and calcium treatment – normally carried out in a vacuum in basic-lined ladles to

fine-tune the chemical composition of the steel. The white-hot metal is then cast in a continuous caster.

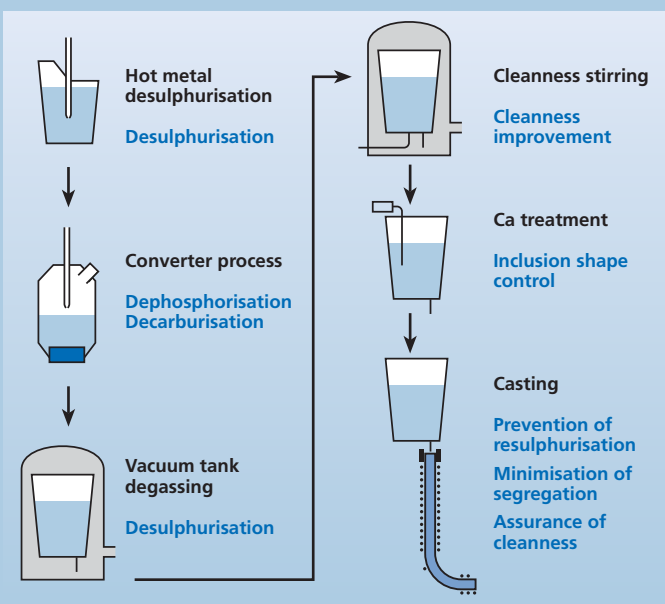
The towns of Dillingen, Dunkerque and Mülheim have one interesting feature in common. High-quality steel plate for EUROPIPE large-diameter pipe is produced at all three locations. In a thermo-mechanical rolling process, supported by state-of-the-art process control, the plate is rolled at precisely defined temperatures and with exactly controlled amounts of reduction.

The required fine-grained, homogeneous microstructure boasting optimum strength and toughness is obtained through recrystallisation, transformation and precipitation. This process, which combines thermomechanical rolling with the possibility of accelerated cooling, produces steel plate of extremely high strength, toughness and sour gas resistance.

In all three rolling mills, the plate undergoes stringent ultrasonic examination before being sent to the large-diameter pipe mill. The inspection covers up to 100% of the plate surface.

Production steps of steels with high cleanliness requirements for sour service

Steelmaking step / Metallurgical objectives



Quality under the microscope.

Data protection does not apply to pipes.

Every “Europipe” we supply has already made history before it leaves our works. In fact, its production heritage could fill volumes. Even our steel suppliers are integrated into our quality management system, allowing us to trace every step in the production process from molten metal through to finished pipeline.

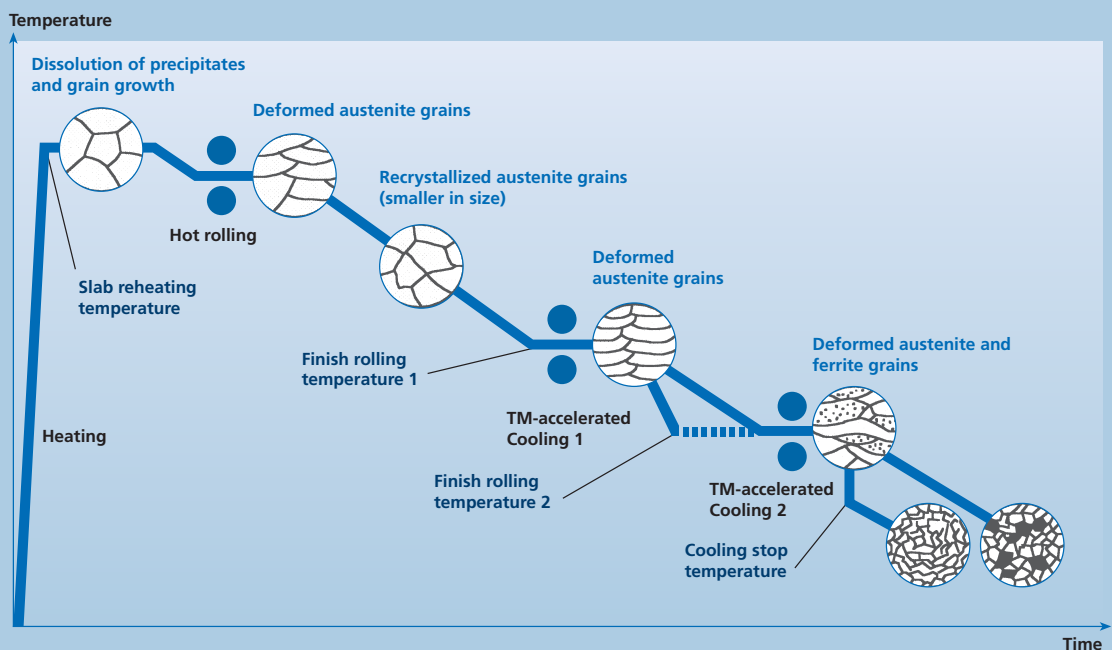
All our pre-material suppliers are ISO 9001:2000 certified as well for health and safety (OHSAS 18001) as for environmental standards (ISO 14001). Yet there is no such thing as data protection for our pipes: We can supply any information about them our customers may need.

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 toughness 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.

Even though we lead the market, our quest for continuing quality leadership means we never rest on our laurels. Experts from EUROPIPE and our plate mill partners are constantly looking at new materials solutions and ways of enhancing our already advanced processing technology. After all, we have a name to live up to – the best in the business, if you ask our customers.

Schematic illustration of thermomechanical rolling with and without accelerated cooling after the 2nd and 3rd rolling stage



① Ultrasonic testing of plate material with 100 % coverage

② Ultrasonic testing of plate material with 100 % coverage

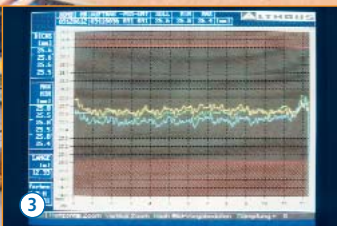
③ Automatic wall thickness measurement



①



②



③

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