

OFFSHORE AND LINEPIPE

Your Partner for innovative solutions

voestalpine Grobblech GmbH
www.voestalpine.com/grobblech

voestalpine
ONE STEP AHEAD.

STEEL IS OUR WORLD

Steel supports

Steel moves

Steel inspires

Steel is future

OVERVIEW PRESENTATION OFFSHORE AND LINEPIPE

- » [voestalpine-GROUP](#)
- » [voestalpine-Steel Division](#)
- » [voestalpine-Grobbblech](#)
- » [Offshore and linepipe](#)
- » [Linepipe plates](#)
- » [Clad linepipe plates](#)
- » [Offshore plates for oil and gas](#)
- » [Offshore plates for wind energy](#)
- » [High-strength plates](#)
 - » [High-strength plates](#)
 - » [Shipbuilding steel plates](#)
 - » [Chords and racks](#)
- » [Services, Partners, Contact](#)
- » [Backup](#)

voestalpine-GROUP

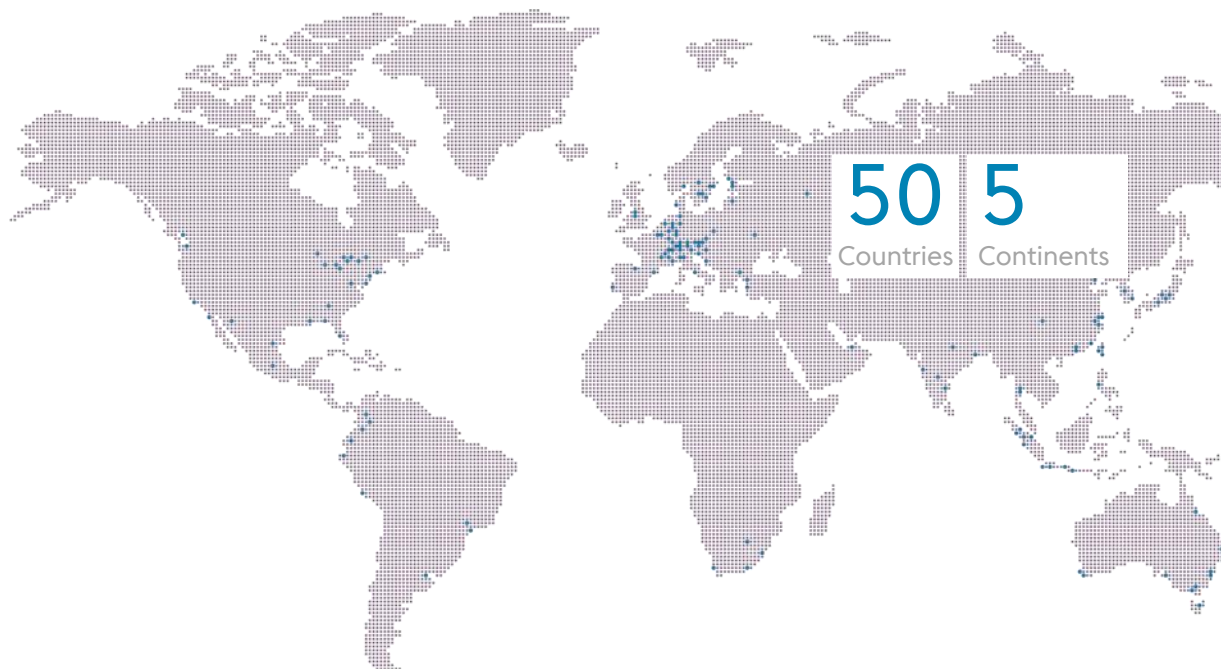
THE voestalpine GROUP



voestalpine is a **technology and industrial-goods enterprise** whose business units boast **worldwide leadership** in combined material and processing expertise.

With its **highest-quality products and systems** made of steel and other metals, voestalpine is one of Europe's **leading suppliers** to the automotive, household-appliance and oil/gas industries worldwide.

GROUP



500

Group companies and locations



51,600

employees worldwide



13 bn.

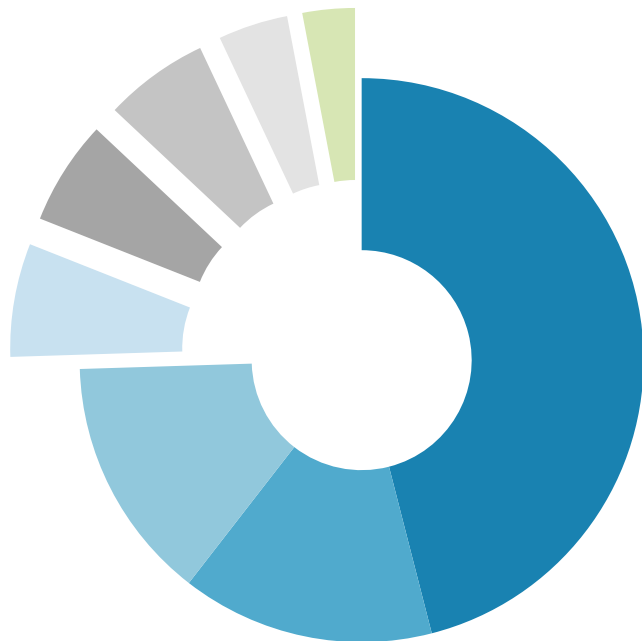
in revenue in 2017/18 FY



2 bn.

EBITDA in 2017/18 FY

GROUP SHAREHOLDER STRUCTURE



44 %
Austria

14 %
Employee shareholding
scheme

15 %
North America

7 %
Rest of Europe

6 %
Scandinavia

6 %
UK, Ireland

6 %
Germany

2 %
Asia (as of 2017/18 FY)

voestalpine-STEEL DIVISION

STEEL DIVISION VALUES

Our

leadership in quality

is put to the test on a daily basis

Innovative power

Focus on service

High value

Flexibility

STEEL DIVISION

DATA AND FACTS



43

locations worldwide



~11,000

employees (full-time equivalent)



5.2 million

tons of manufactured end products
in 2017/18 FY



Revenue

2016/17 FY

2017/18 FY

3,912.4

4,772.7

EBITDA

563.9

908.2

EBITDA margin (%)

14.4

19.0

EBIT

263.2

592.9

EBIT margin (%)

6.7

12.4

STEEL DIVISION LOCATIONS



STEEL DIVISION COMPANIES

Companies along the value-added chain



STEEL DIVISION

CUSTOMER SEGMENTS



Automotive Industry



Electrical Industry



House Industry



Machinery Industry



Processing Industry



Energy

STEEL DIVISION

What makes us
unique?



R&D and innovation



Certifications



Environment



Awards



Employees

STEEL DIVISION INNOVATION HIGHLIGHTS



Energy



A heavy plate that maintains its strength and toughness even at extremely low temperatures, toughcore® takes our customers beyond previously insurmountable limits.



R&D at voestalpine makes it possible



voestalpine-GROBBLECH

OUR MESSAGE



- » We are a global supplier of high-quality niche products in the energy business.
- » We offer innovative solutions for structural steel work, bridges and cranes, based on the technological developments in the energy branch.

OUR OFFER



Our **products** find their applications in the extreme conditions:

Strength

Toughness

Wear resistance

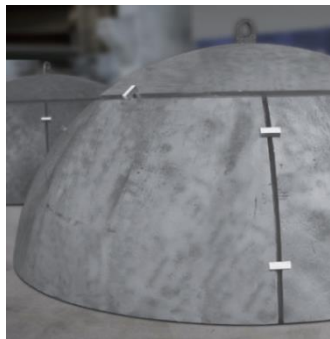
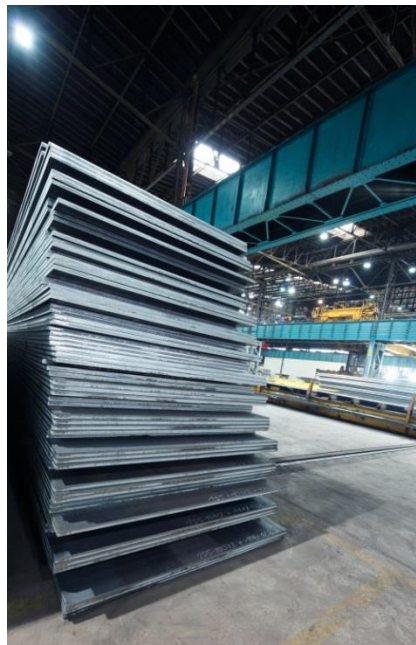
Corrosion resistance

WE DELIVER TO VARIOUS INDUSTRIES



- » Oil- and gas industry
- » Pressure vessel and apparatus sector
- » Chemical industry and refineries
- » Structural steel work and bridges
- » Vehicles and crane sector
- » Ship building
- » Steel service centers and traders

OUR PRODUCTS



- » Linepipe and Offshore plates
- » Pressure vessel plates and heads
- » Clad plates and heads
- » High-strength plates
- » Wear-resistant plates
- » Multi-layer plates
- » Special heavy plates
 - » Structural steels
 - » Fine-grain structural steels
 - » Shipbuilding steels
 - » Case hardening and Q+T steels
- » Chords

OUR BRANDS



alform[®]
thermomechanically rolled

toughcore[®]
excellent toughness even to the core

durostat[®]
wear-resistant



aldur[®]
quenched & tempered

altrix[®]
multi-layer plate



voestalpine Grobblech GmbH

21 | 26.06.2018 | Offshore and linepipe

voestalpine

ONE STEP AHEAD.

OUR SALES BRANCHES



HVU Upstream

Wolfgang Leeb
wolfgang.leeب@voestalpine.com



HVD Downstream

Regina Leidinger
regina.leidinger@voestalpine.com



HVM Machinery
Industry

Jürgen Lechfellner
juergen.lechfellner@voestalpine.com



voestalpine Grobblech GmbH

22 | 26.06.2018 | Offshore and linepipe

voestalpine

ONE STEP AHEAD.

INVESTMENT 2015

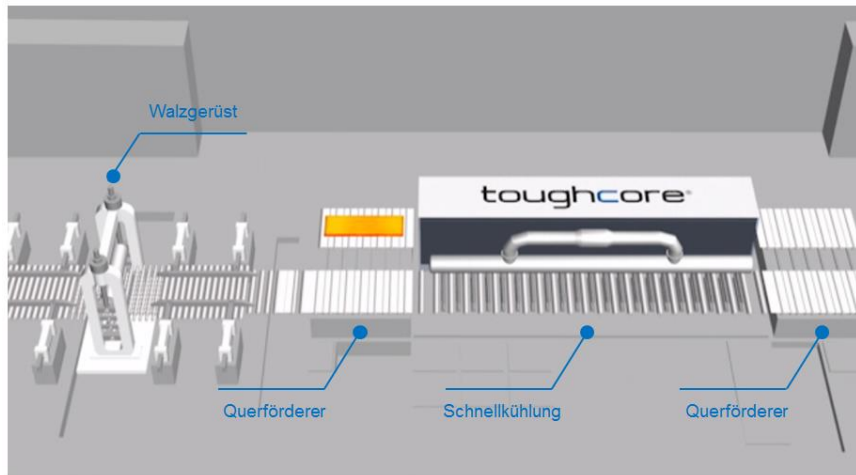


Video: [New Rolling mill](#)

New rolling mill:

- » Width 4,2 m (unchanged)
- » Increased rolling force up to 8,000 tons
- » Work roll shifting for improved flatness
- » Commissioning in Nov 2015

INVESTMENT 2016



Video: [The manufacturing process](#)

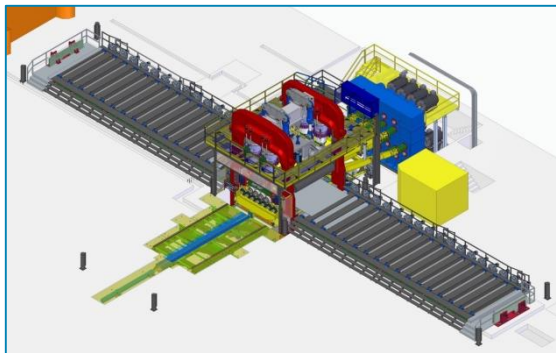
toughcore® facility:

- » Extraordinary fine micro-structure in mid-thickness is achieved by using the toughcore® process which is based on TMCP rolling and accelerated cooling with intermediate fast reheating
- » Commissioning in October 2016

INVESTMENTS UP TO 2020



- » New **chamber furnace** for optimized reheating of clad plate packages before rolling
 - » Commissioning: May 2019



- » New **levelling machine** to improve the flatness of clad plates
 - » Commissioning: May 2020



OFFSHORE AND LINEPIPE

QUALITY FROM voestalpine

As a provider of quality solutions, we have adapted the ambitious standard of supplying our customers with the **best steels** and **excellent material properties**.

Quality begins in our steelmaking plant

- » Fully integrated metallurgical facility
- » High-quality steel slabs
- » Short transport distances inside our dedicated metallurgical facility
- » Highest degree of purity
- » Best mechanical properties of our steel grades

EXTRAORDINARY REQUIREMENTS CALL FOR EXTRAORDINARY STEEL



- » High cleanliness of steel due to LD-process with subsegment metallurgical and vacuum treatment
- » High-quality slabs up to 355 mm in thickness
- » Minimized center segregation by soft reduction during continuous casting
- » Specialization in thermomechanical rolling with accelerated cooling.

Our strengths are our expertise and experience

PRODUCTION SYSTEM



Efficient
processing for
our customers

Our state-of-the-art production systems implement the most modern technologies and ensure **consistently high quality**. We ensure **homogeneous technological values** in our steels along the entire production chain.

Our production system offers optimal size tolerances, best flatness and perfect plate surface as well as reproducible mechanical-technological properties.

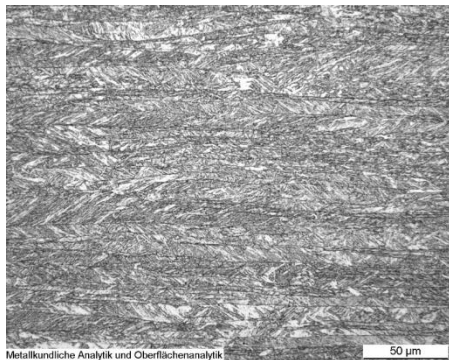
PRODUCTION SYSTEM



- » New rolling mill
 - » Width 4,2 m
 - » Rolling force up to 8,000 to
 - » Work roll shifting for improved flatness
- » Accelerated cooling line
 - » Basis for best TMCP-steels
- » World's strongest hot leveling machine
- » New second pusher-type furnace

THERMOMECHANICAL ROLLING

TMCP + ACC¹



QT



- » TMCP – (Thermo-Mechanical-Control-Process) steels
- » Thermomechanical rolling leads to a very fine-grained structure, which results in high strength combined with excellent toughness and best formability levels.

¹ ACC... accelerated cooled

TMCP – OUR STRENGTH

- » TMCP- (Thermo-Mechanical-Control-Process) steels are fine-grained steels with
 - » excellent weldability
 - » high strength combined with high toughness
 - » best formability
 - » high reliability in welded structures
- » TMCP-Steels are produced with
 - » very pure steel (low S-, P-, tramp element level)
 - » very low carbon content and low carbon equivalent (CE)
 - » micro-alloying
 - » high-quality processing during melting, casting, rolling and accelerated cooling



TMCP – CUSTOMER BENEFITS

- » Substantial reduction or eliminating of preheating
 - » Great savings in manufacturing costs
 - » Improved working environment for operators
- » Reliable weld joints
 - » Virtually no additional repair welding, even without preheating
- » High-heat-input welding
 - » Major reduction in the number of weld passes
 - » Significantly reduced welding costs
 - » Substantially shorter manufacturing time
- » Easier surface cleaning because scale is thin and homogeneous

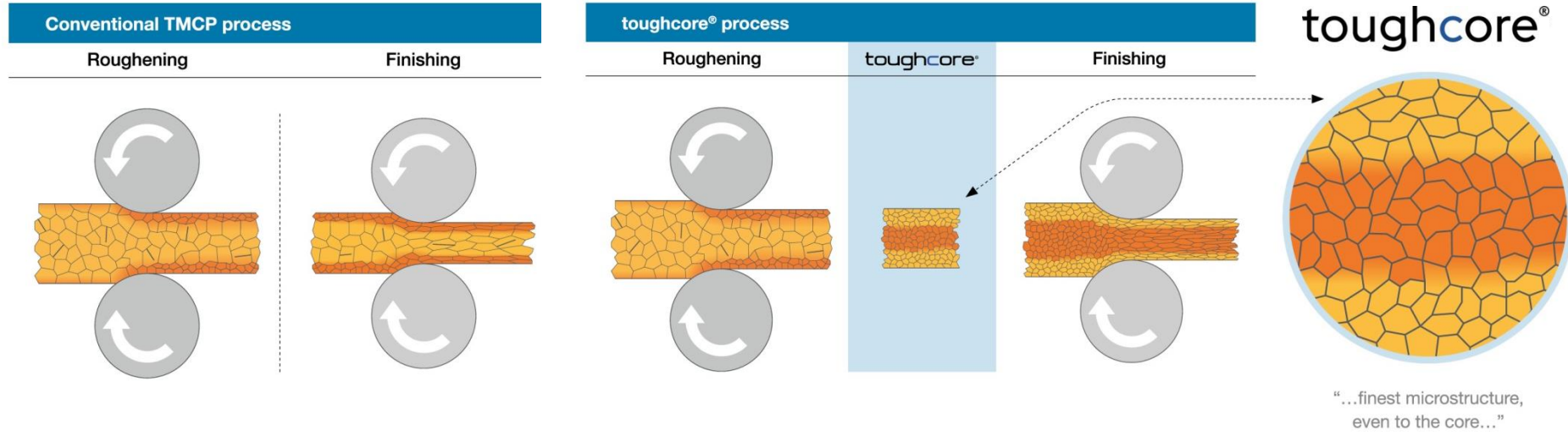


toughcore® - THE INNOVATION

Video: [toughcore®](#)

- » New generation of TMCP steel
- » Heavy plates with finest microstructure even to the core and thus extremely high toughness, made in a completely new and patented process, which cannot be produced on any other production route.
- » Unique combinations of thickness, strength and excellent toughness as well as best weldability
- » Higher safety while enhancing the potential for the use of heavy plate - e.g. at very low temperatures, in ultra-deep sea or for design optimization - for very challenging operating conditions.
- » Cost savings and increased productivity.

toughcore[®] PROCESS



MICROSTRUCTURE

running production



toughcore®

X80 – 50mm



QUALITY ASSURANCE

- » Products, processes and business systems of voestalpine Grobblech GmbH are certified according International Quality Management System Standards, ISO 9001, by Lloyds Register.
- » Quality approvals are held from ABS, DNV-GL, TÜV, API and also for a number of specific offshore contracts for operators including Saudi Aramco, Qatar Petroleum, Shell, Exxon Mobil, Total, Chevron and BP.
- » We can offer a wide variety of steel grades (including e.g. NORSOK ...) and hold qualifications even for high strength steel grades (e.g. AB FQ70, VL F690 ...)

HEALTH, SAFETY AND ENVIRONMENT (HSE)

- » voestalpine Grobblech has created a work environment that values ...
 - » diversity in thought and experience
 - » teamwork
 - » ethical behavior
 - » performance excellence

The HSE management is based on continuous improvement in accordance with international standards, OHSAS 18001, ISO 14001 as well as the EMAS – European Eco Management and Audit Scheme.

BENEFIT FOR OUR CUSTOMER



We are a global supplier of high-quality heavy plates for the energy market and the global leading producer of roll-bonded clad plates.

TAILORED SOLUTIONS IN voestalpine QUALITY



toughcore®

- » Linepipe applications
 - » Linepipe plates
 - » Clad linepipe plates
- » Offshore applications
 - » Offshore plates for oil & gas
 - » Offshore plates for wind energy
 - » High-strength plates
 - » Shipbuilding steel plates
 - » Chords & racks

LINEPIPE PLATES

LINEPIPE PLATES

Sour service in deep ocean



- » More than two million tons of sour-gas-resistant linepipe plates
- » Down to a depth of 3,000 meters below the sea
- » High-strength steels up to X120
- » Extremely low temperatures and strain-based design
- » Up to 20 tons per plate, suitable for pipes up to 48 inches

LINEPIPE PLATES

One of the world's leading producers



- » Very tough linepipe plates for thick-walled deep-sea lines
- » Specialize in modern thermomechanical rolling technology with accelerated cooling
- » Outstanding product quality, reliable service and flexibility
- » On-time shipment and delivery
- » Extreme conditions: arctic temperatures, extreme pressures in the deep ocean, sour service ...

LINEPIPE PLATES

Certifications

API 5L	DNV-GL	GOST	ISO 3183
BM(S)	SAWL 245 (S)		L 245M(S)
X42M(S)	SAWL 290 (S)		L 290M(S)
X46M(S)	SAWL 320 (S)		L 320M(S)
X52M(S)	SAWL 360 (S)		L 360M(S)
X56M(S)	SAWL 390 (S)		L 390M(S)
X60M(S)	SAWL 415 (S)		L 415M(S)
X65M(S)	SAWL 450 (S)	K56	L 450M(S)
X70M(S)	SAWL 485 (S)	K60	L 485M(S)
X80M(S)	SAWL 555 (S)	K65	L 555M(S)
X90M			L625M
X100M			L690M
X120M			L830M

» We supply linepipe plates in accordance with **all applicable standards and specifications** such as API 5L, ISO 3183, DNV-GL and equivalent to Russian GOST.

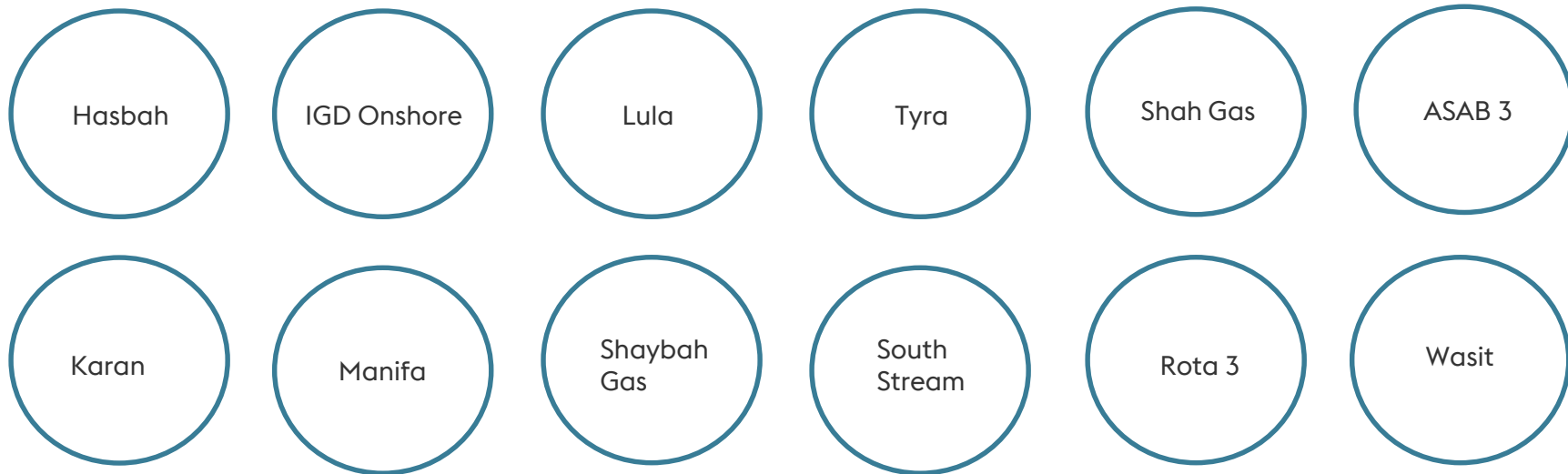
LINEPIPE PLATES

Our strengths

- » Sour service of pH3 up to X80
- » High strength up to X120
- » Excellent toughness at low temperatures and best weldability
- » High uniform elongation for strain-based design
- » Plate length up to 18.7 m and weight up to 20 tons per plate

LINEPIPE PLATES

References Sour Service



LINEPIPE PLATES

References Sweet Service

Kaombo
Angola

Stampede

Nord Stream
Phase 2

Lucius

Khurais

Laggan

Big Foot

Jack /
St. Malo

Arkutun
Tagi

Nord Stream
Phase 1

Perdido

Blind Faith

LINEPIPE PLATES

toughcore® for Linepipe applications



- » Higher levels of operational safety
- » Increased productivity and capacity of pipeline and auxiliary equipment
- » Optimized manufacturing processes
- » High strength for decreased weight and cost
- » Linepipe plates for extremely low temperatures and the ultra-deep sea

CLAD LINEPIPE PLATES

CLAD LINEPIPE PLATES

Market leader for extreme sour service and corrosion resistant environments



- » The world's leading producer of roll-bonded clad plates with a capacity of 60,000 mt per year
- » Our partners process these clad plates into pipes which withstands the highest mechanical stress and dynamic loads – suited to deep-sea applications under highly corrosive conditions
 - » 10 km/ month
 - » 120 km/ year

CLAD LINEPIPE PLATES

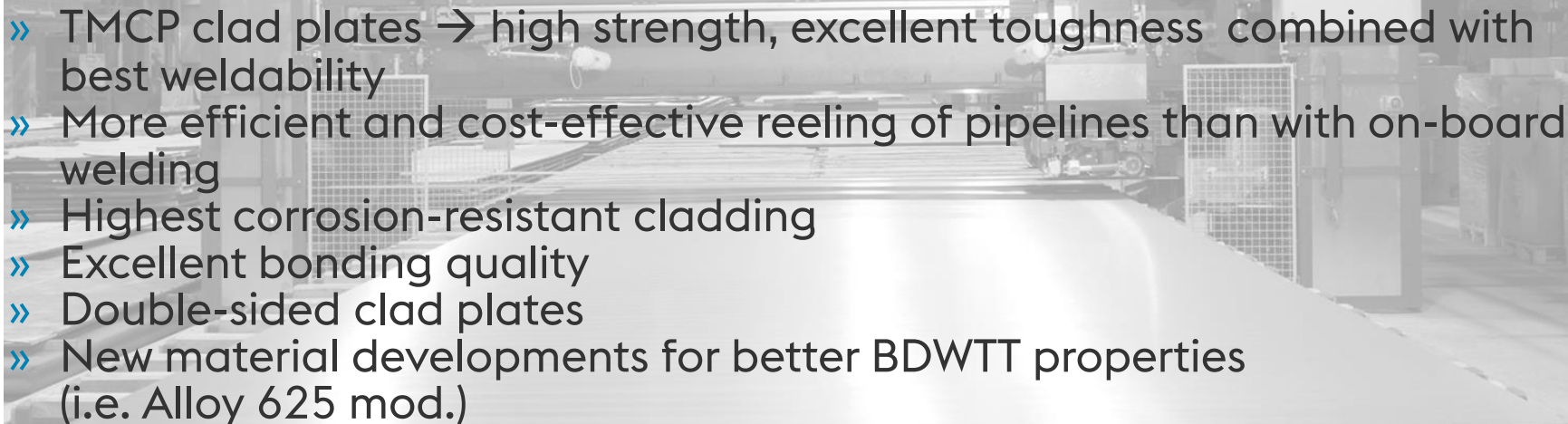
The world's leading producer



- » Material combination X60/65 with nickel-based (alloy 625, 625 mod., 825) or austenitic stainless alloy (316L, 317L ...)
- » Metallurgical bonding for cost-effective reeling
- » Applications: catenary risers, high-strength linepipes for deep sea applications, Bends and Fittings
- » Wide dimensions (pipe diameter, wall thickness) possible

CLAD LINEPIPE PLATES

Our strengths

- 
- » TMCP clad plates → high strength, excellent toughness combined with best weldability
 - » More efficient and cost-effective reeling of pipelines than with on-board welding
 - » Highest corrosion-resistant cladding
 - » Excellent bonding quality
 - » Double-sided clad plates
 - » New material developments for better BDWTT properties (i.e. Alloy 625 mod.)

CLAD LINEPIPE PLATES

References

Zohr

Cornegliano

Bahr Essalam

Arbi /
Karan

Maria

Kashagan

Egina

Kraken

Ichtyis

Wasit

Wheatstone

Julimar

LINEPIPE AND CLAD LINEPIPE PLATES

Our customers



OFFSHORE PLATES FOR OIL & GAS

OFFSHORE PLATES FOR OIL & GAS

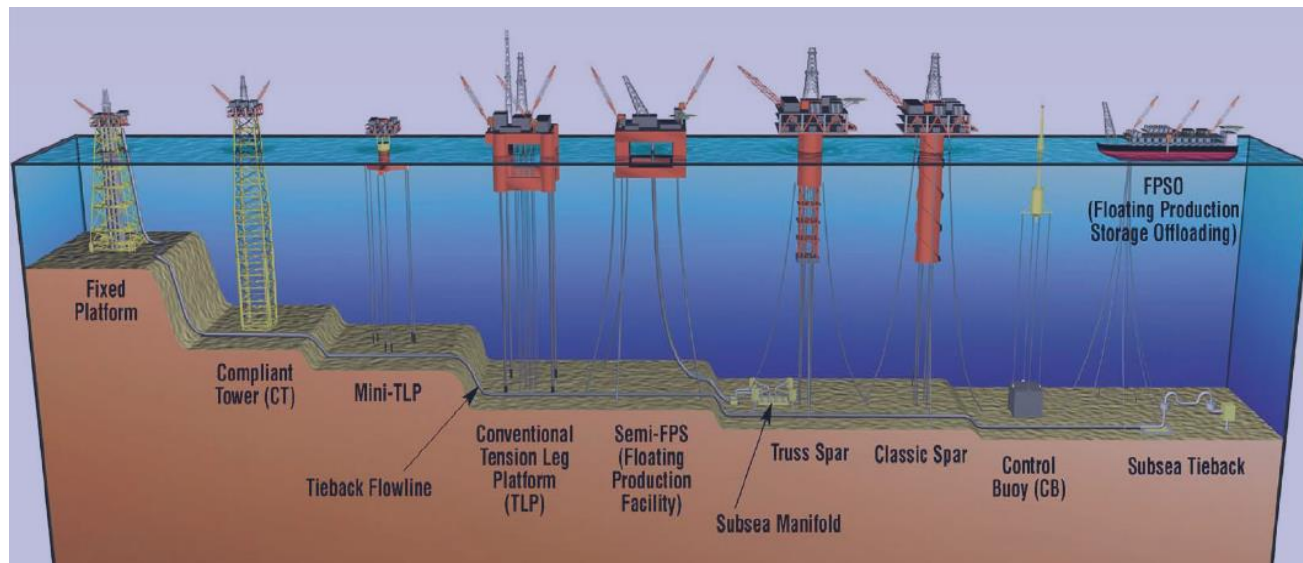
Prequalified in arctic regions



- » In worldwide use under the harshest conditions
- » Prequalified to ensure greater safety
- » Arctic steel for extremely low temperatures
- » Thick, wide and heavy
 - » TMCP plate thicknesses up to 130 mm
 - » Plate widths up to 3,850 mm
 - » Plate lengths up to 18,700 mm
 - » Weight up to 28 tons per plate

OFFSHORE PLATES FOR OIL & GAS

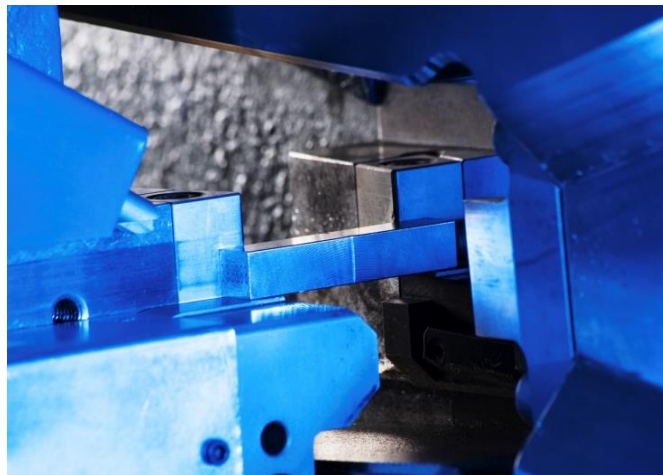
Types of platforms



We supply
high-quality
steel plates
for all
structures

OFFSHORE PLATES FOR OIL & GAS

Ensure greater safety



- » Prequalified material with plate thicknesses up to 101.6 mm and CTOD values down to -40°C for applications in arctic regions. (EN 10225 (including NORSOK) and API RP2Z)
- » Our TMCP offshore plates are characterized by a high degree of toughness and excellent weldability.

OFFSHORE PLATES FOR OIL & GAS

Certifications

Yield Strength Class (Mpa)	Standard	Thickness (mm)	CVN Test (°C)	CTOD Test (°C)
355	API 2W-50, API 2W50T	102	-40	-10
	S355G8/G9/G10+M	102	-40	-10
	NORSOK M-120 Y20, Y25	102	-40	-10
420	API 2W-60	102	-40	-10
	API 2W-60 Artic Steel	80,6	-80	-40
	S420G1/G2+M	102	-40	-10
	NORSOK M-120 Y30, Y35	102	-40	-10
460	S460G1/G2+M	102	-40	-10
	NORSOK M-120 Y40, Y45	86	-40	-10
500	NORSOK M-120 Y50, Y55	86	-40	-10

» Pre-qualified according to EN10225, Annex E / API RP2Z

OFFSHORE PLATES FOR OIL & GAS

References / Projects

Johan
Sverdrup

ZOHR

Maersk
Culzean

Total
Egina

Filanowsky

BP Shah
Deniz 2

Hess
Stampede
TLP
Topside

WOG –
South
Timbalier

Prelude
FLNG
Project

Shell Vito
Chickasaw

Total
Kaombo

Total Moho
Nord

OFFSHORE PLATES FOR OIL & GAS

toughcore® for offshore structures



- » Protect arctic offshore structures against ice loads and collisions
- » Optimize the design of components and structures
- » Light-weight design to reduce cost of manufacturing, transportation and installation
- » Explore harshest environments

OFFSHORE PLATES FOR OIL & GAS

Our customers



OFFSHORE PLATES FOR WIND ENERGY

OFFSHORE PLATES FOR WIND ENERGY

Extra heavy XL plates



- » High-quality plates for efficient power generation
- » Larger monopiles require higher unit weights
- » Up to 60 tons unit weights by innovative welding

OFFSHORE PLATES FOR WIND ENERGY

Plates for efficient electric power generation



- » Toughest materials for offshore wind energy systems
- » High-quality plates for the foundations of offshore wind turbine (monopiles, transition pieces, jackets)
- » Larger monopiles require higher unit weights in cylindrical and tapered pipe lengths.

OFFSHORE PLATES FOR WIND ENERGY

XL plates with higher unit weights



- » Higher unit weights by welding
- » Highly qualified welding personnel
- » Highly efficient and innovative welding technique
- » Plate edge preparation for circular seam welding
- » Plate cut to conical shape (ready to use)
- » Welded and extra-heavy XL plates
 - » TMCP plate thicknesses up to 130 mm
 - » Weights up to 60 tons per plate
 - » Plate widths up to 3,950 mm

OFFSHORE PLATES FOR WIND ENERGY

References / Project

East
Anglia

Beatrice

Arkona

Borkum
Riffgrund

Wikingen

Sandbank

Gemini

Baltic 2

Humber
Gateway

Butendiek
Substation

Global
Tech

Walney



HIGH-STRENGTH PLATES

HIGH-STRENGTH PLATES

Weight savings and optimized weldability



- » Minimum yield strengths of 700 MPa up to 1100 MPa
- » High-strength decreases weight
- » TMCP for excellent toughness and optimized weldability
- » Specific advantages:
 - » Higher stresses
 - » Further cost savings in transport, assembly and processing (excellent welding properties)

HIGH-STRENGTH PLATES

Specific advantages

alform[®]
[microsite: alform[®]](#)

- » alform[®]: low carbon fine-grained TMCP steels with excellent weldability, toughness and cold forming behavior

aldur[®]

- » aldur[®]: water-quenched, high-strength fine-grained steels with excellent toughness at low temperatures

SHIPBUILDING STEEL PLATES

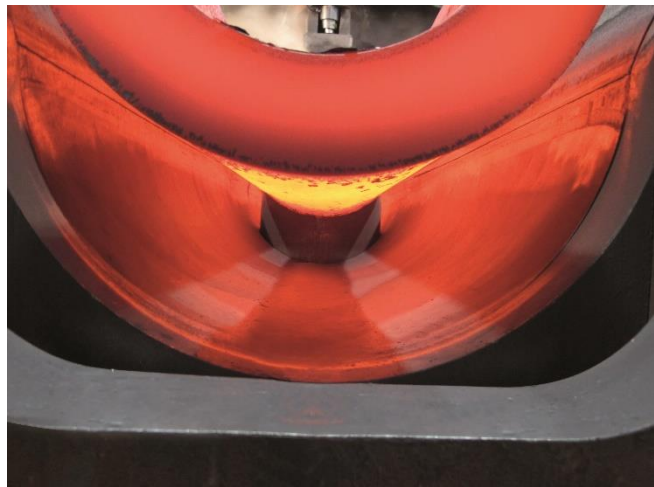
Certified for high-strength



- » Used in offshore applications, platform superstructures and special ships
- » High-strength shipbuilding steels
 - » FQ70 up to 101.6 mm (4")
- » Certified by all renowned certification companies (DNV-GL, ABS, ...)

CHORDS & RACKS

High-strength hot-formed special components



- » Structural components of jack-up rigs
(Chords and thick plates for gear racks)
- » High-strength hot-formed in our in-house press shop
- » High degree of accuracy to shape

CHORDS & RACKS

Steel grade & Dimensions

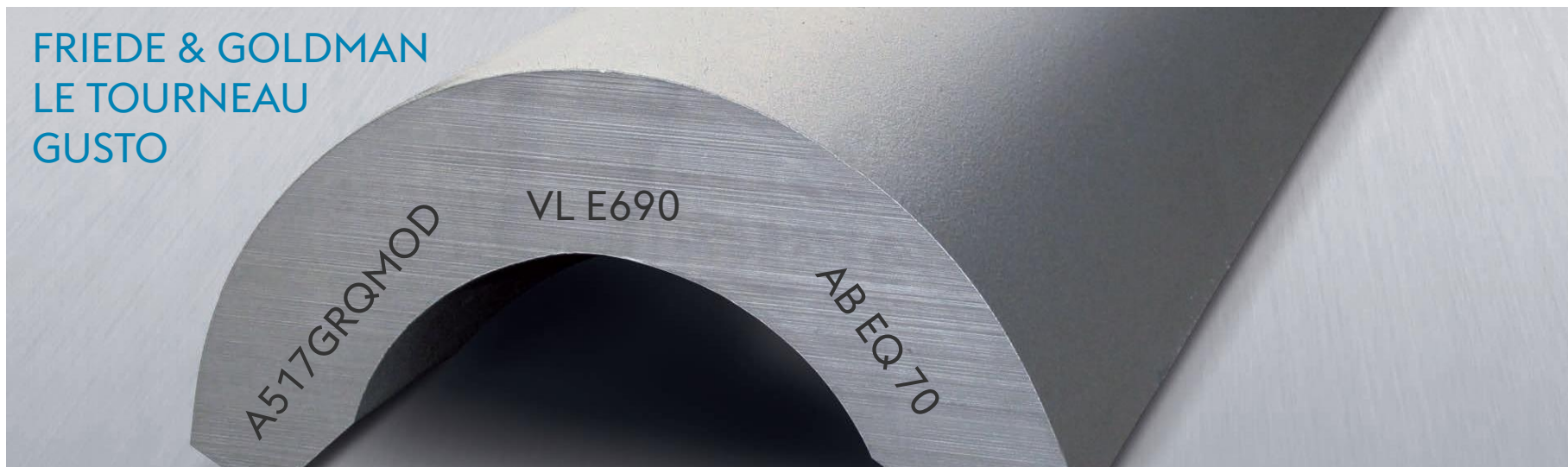


- » Steel grade:
 - » voestalpine special steel aldur 700QL1, S690 QL1, AB EQ/FQ70, VL E/F690
- » Dimensions:
 - » Chords: Length up to 4,200 mm, wall thickness up to 120 mm
 - » Rack steel plates up to 210 mm

CHORDS & RACKS

Capabilities

FRIEDE & GOLDMAN
LE TOURNEAU
GUSTO



HIGH-STRENGTH PLATES

Certifications

Yield Strength Class (MPa)	Grade	Delivery Condition	Thickness (mm)
500	NV A/D/E/F500	QT	102
500	NV A/D/E/F550	QT	102
500	NV A/D/E/F620	QT	86
500	NV A/D/E/F690	QT	86

» High-strength
steels according to
DNV

HIGH-STRENGTH PLATES

Certifications

Yield Strength Class (MPa)	Grade	Delivery Condition	Thickness (mm)
500	AB A/E/D/FQ51	QT	102
	AB A/E/D/FQ51	TMCP	50,8
550	AB A/E/D/FQ56	QT	102
	AB A/E/D/FQ56	TMCP	50,8
620	AB A/E/D/FQ63	QT	102
	AB A/E/D/FQ63	TMCP	50,8
690	AB A/E/D/FQ70	QT	102
	AB A/E/D/FQ70	TMCP	50,8

- » High-strength steels according to ABS
- » All shipbuilding steel plates according to ABS, BV, DNV-GL and LRS.

WE TALK SOLUTIONS

Progress through R&D

- » Continual product and process development
- » Innovative solutions for products and processes
- » Independent and fully accredited testing facility on site
- » Prequalification of offshore structural steels in our own labs
- » Simulations of material performance of weldability, deformation and edging behavior, fatigue tests and fracture mechanics
- » Consultation in the fields of welding and processing

WE TALK SOLUTIONS

A unique logistics package

- » Partnerships with our clients and customers
- » Reliable and flexible delivery performance
- » Professional project management ensuring successful delivery of complex orders
- » Dedicated mill-based project management team for order management
- » Complete project documentation package (inspection and testing plan, manufacturing specifications, ultrasonic testing procedures)
- » Prompt reaction to inquiries
- » Web-based customer service center with customer access to order confirmations, invoices, test certifications and order status

WE TALK SOLUTIONS

A strong partnership

- » Close collaboration with our Group companies in order to create unique expertise and the technological leadership of our products in the energy sector
- » For more information about energy-related products supplied by the voestalpine Group, please also visit:
 - » voestalpine Böhler Welding GmbH
www.boehlerweldinggroup.com
 - » voestalpine Tubulars GmbH und Co KG
www.voestalpine.com/tubulars
 - » voestalpine Austria Draht GmbH
www.voestalpine.com/austriadraht

OFFSHORE & LINEPIPE

Our partners



أرامكو السعودية
saudi aramco



ONE STEP AHEAD.

CONTACT

Professional sales personnel

- » Wolfgang Leeb (Head of Sales Branche Upstream)
wolfgang.leeb@voestalpine.com
- » Michael Pelzguter (Linepipe / Offshore)
michael.pelzguter@voestalpine.com
- » Andreas Mairhofer (Linepipe / Offshore)
andreas.mairhofer@voestalpine.com
- » Wolfgang Friesacher (Linepipe / Offshore)
wolfgang.friesacher@voestalpine.com

