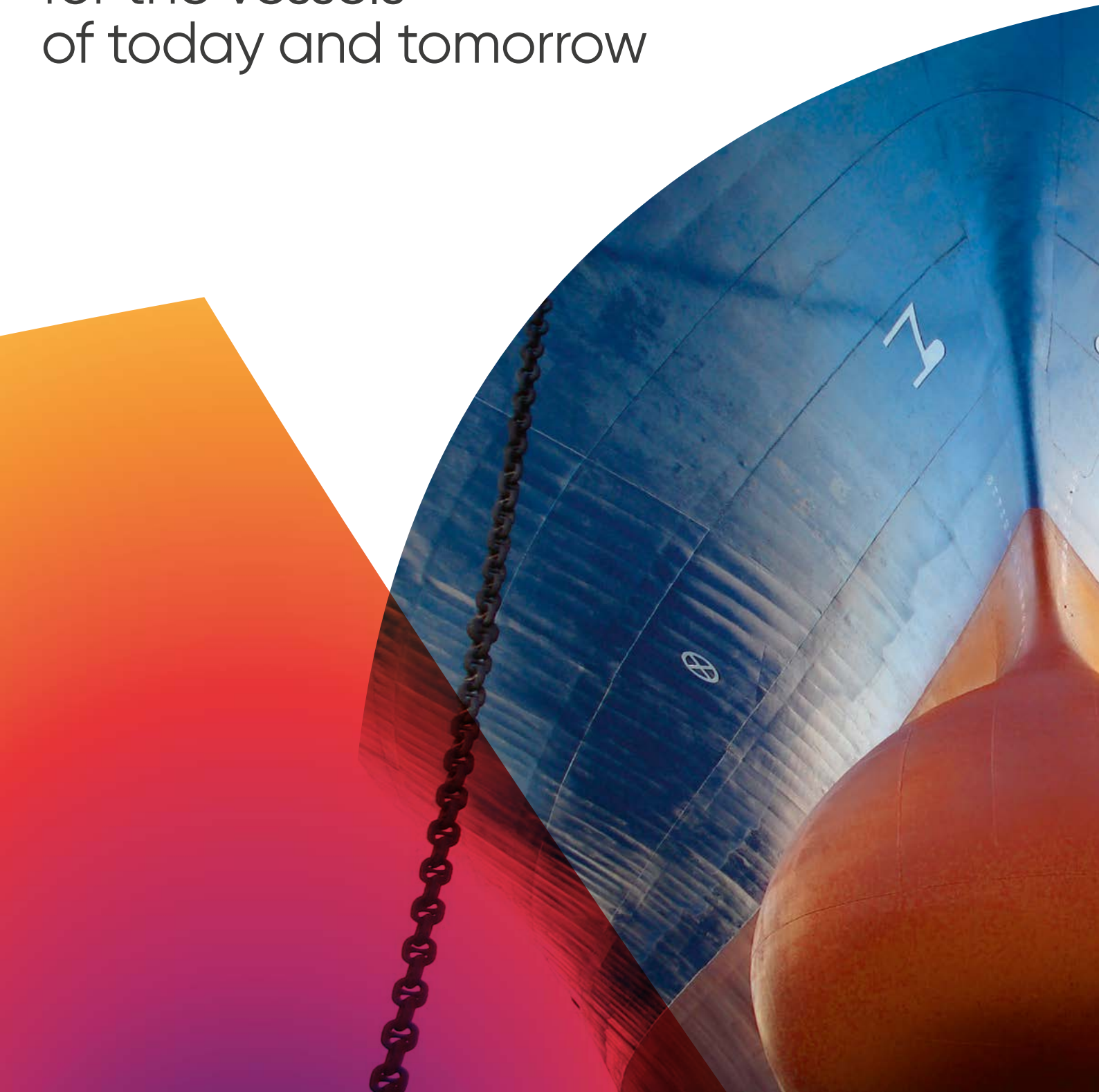




# Your reliable partner

for the vessels  
of today and tomorrow



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# ArcelorMittal: Working in close partnership with shipbuilders

ArcelorMittal offers:

- A fully dedicated customer organisation to assist you throughout the entire project
- Global presence to support your projects
- A wide range of high quality and certified steels
- Continuous development of our product offer to bring extra value to our customers and the end user
- A comprehensive research and development approach to help our customers develop new solutions.

As a leading supplier of steels for shipbuilding, ArcelorMittal remains close to our customers at every stage of the process. We constantly monitor the market, adjust our offer accordingly and tailor our approach to the specific needs of individual shipyards.

ArcelorMittal's offer in naval grades includes hot rolled sheets for thinner applications and heavy plate up to 80 mm thick and 3,300 mm wide. Our steel grades are strong, making them suitable for demanding environments such as arctic and deep-sea vessels.

Our extensive offer of metallic coated and pre-painted steels will enrich and customise ship cabins and interiors.

Thanks to ArcelorMittal Distribution Solutions we can provide cut-to-length sheets for hot rolled, pre-painted and metallic coated steels.

ArcelorMittal is already working to further develop our portfolio of shipbuilding steels and innovative services to support shipyards.



# Extended offer for shipbuilders

## Heavy plate offer

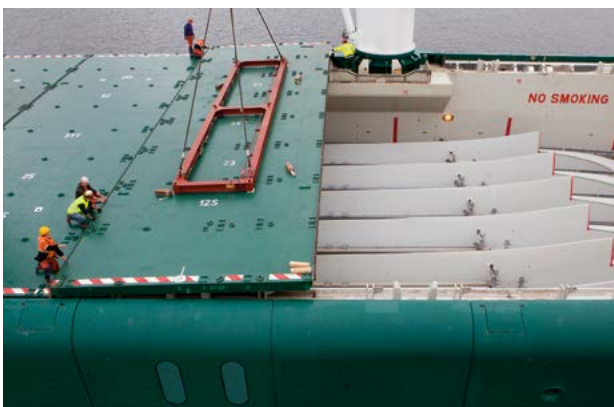
ArcelorMittal heavy plate is used in hulls, decks and structural parts of the following types of ships:

Cruise liners and ferries	
Commercial vessels	Container ships
	Bulk carriers
	LPG and LNG tankers
	Chemical and oil tankers
	Fishing vessels
Special vessels	Offshore applications
	Wind tower installation vessels
	Arctic vessels
	Offshore wind service vessels
	Ocean survey and research vessels

## Heavy plate specifications

ArcelorMittal Europe – Flat Products offers a wide range of heavy plate for shipbuilding from our quarto mill in Gijón (Spain).

Heavy plate can be delivered as rolled (AR), normalised (N), normalised rolled (NR) and thermomechanically rolled (TMCP), depending on the customer's technical requirements and according to standards and accreditation bodies requirements.



## Naval certification

ArcelorMittal's shipbuilding grades are certified by most of the world's leading accreditation bodies including:

- American Bureau of Shipping (ABS) – United States
- Bureau Veritas (BV) – France
- Det Norske Veritas (DNV) – Norway
- Lloyd's Register (LR) – United Kingdom
- Registro Italiano Navale (RINA) – Italy
- Nippon Kaiji Kyokai (NKK) – Japan

Our quarto mill in Gijón can assist with new certifications where required.

In accordance with rules of classification societies:

- Naval grades: A, B, D, E
- AH32, DH32, EH32, FH32
- AH36, DH36, EH36, FH36
- AH40, DH40, EH40, FH40

## Heavy plate dimensional feasibility (naval grades)

Thickness	Up to 80 mm
Width	Up to 3,300 mm
Length	Up to 25,000 mm
Weight	Up to 18 tonnes

## Heavy plate delivery conditions

Test	Standard	Values
Z Testing	EN 10164 ASTM A770	Z15, Z25, Z35
Ultrasonic Testing	EN 10160 ASTM A770	
Toughness		Up to KV -60°C
C <sub>eq</sub>		AH-36, DH-36, EH-36, FH-36 ≤ 0.40 Smaller C <sub>eq</sub> on request

Size and tolerances meet the EN 10029, ASTM A6, ASTM20, and JIS G 3193 standards.

Surface quality meets EN10163 and naval regulation.

Our heavy plate can be shot blasted, or shot blasted and pre-painted.

# Hot rolled sheets offer

ArcelorMittal Europe – Flat Products produces hot rolled coils which can be cut to your specifications. The minimum length is two metres.

## Technical grades:

- Naval<sup>®</sup> A; Naval<sup>®</sup> B; Naval<sup>®</sup> D
- AH-32; DH-32; AH-36, DH-36, FH-36

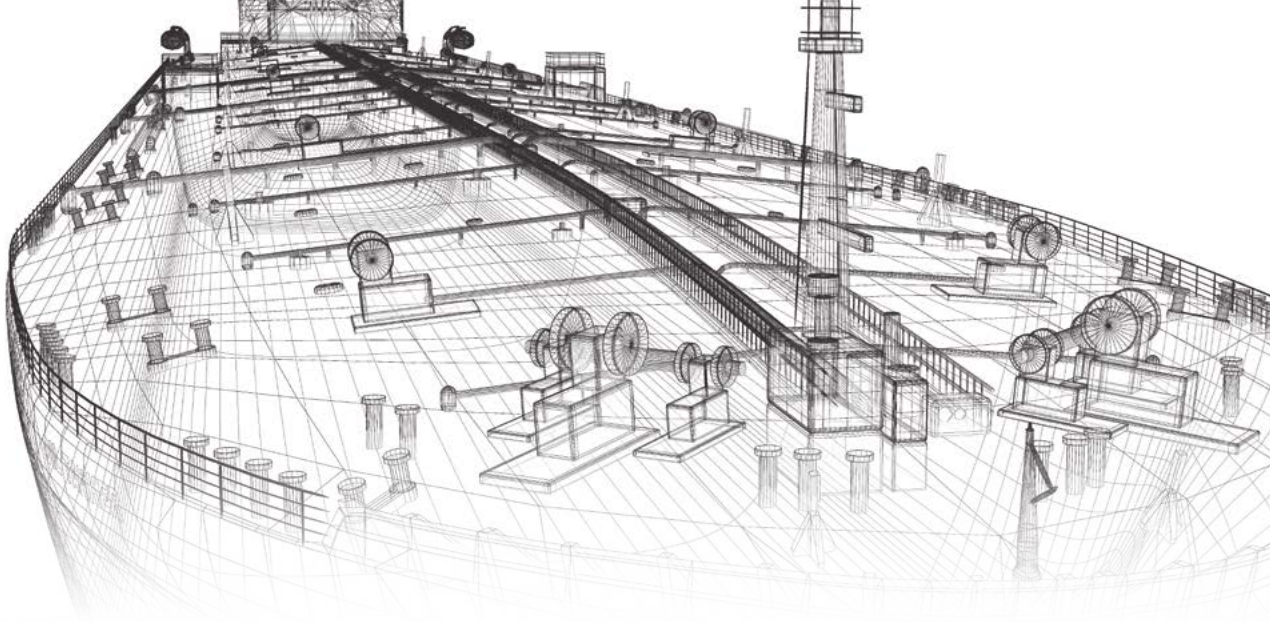
The technical grades produced by our hot rolling mills are certified by the following accreditation bodies:

- Bureau Veritas (BV) – France
- Det Norske Veritas (DNV) – Norway
- Lloyd's Register (LR) – United Kingdom



*Courtesy of GONDAN Shipyard*





## Special markets and applications

Industeel, a wholly owned subsidiary of ArcelorMittal Europe, is the leader in special markets for alloyed plates. Industeel serves specialised sectors such as shipping, oil and gas, nuclear, cryogenic, and specialised distribution markets. Industeel can also provide prefabricated pieces and associated services on request.

Industeel's maritime certifications :



### Chemical tankers

Industeel has 30-years experience building duplex tankers with a reference list of more than 120 ships. The ships range from inland vessels to seagoing tankers up to 43,000 DWT. Industeel offers a wide range of lean duplex and super-duplex grades.

The newest generation of chemical transport vessels use tanks made from duplex grade UR 2205.

Dimensional feasibility of duplex plates:

Length	Up to 16,000 mm
Width	Up to 3,500 mm
Thickness	From 5 to 120 mm

### Liquefied natural gas (LNG) carriers & fuel tank for motorisation

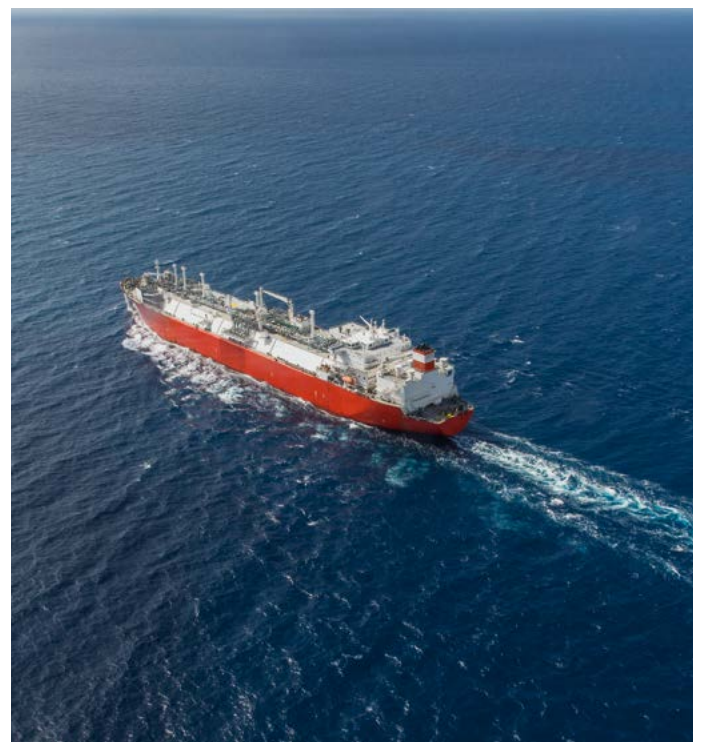
Industeel has developed a wide range of nickel-alloyed ferritic and stainless steels specially designed for cryogenic gas storage and transportation. These include:

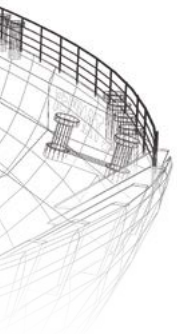
- CryElso® 0.5 (0.5% Ni steel grade)
- CryElso® 9Q (9% Ni)
- Grades 304N; 304LN; 316LN; and CryElso® 201LN for piping, storage tanks and fuel tanks.

Cryogenic transportation demands the highest levels of safety. Industeel's CryElso® range ensures the best balance between strength, toughness and weldability.

Industeel's CryElso® range is available in the following dimensions:

Length	Up to 16,000 mm
Width	Up to 4,000 mm
Thickness	From 5 to 200 mm and above





## Wind tower installation vessels (WTIV)

Installation and maintenance operations of offshore wind farms require dedicated vessels. Industeel can provide ultra thick high strength SuperElso® 690CR in thicknesses up to 10 inches and/ or jack-up rig legs components for WTIV ready to be assembled at shipyard.

Ultra high strength material and EN10225 compliant offshore grades in very thick sections can be provided for various onship equipments, such as cranes, rack shocks, ...

Grades:

- EN 10225:2009 S355G10+N (250 mm)
- EN 10225-1:2019 S355NLO or 1.8808 (250 mm)
- EN 10225:2009 S420G2+QT (200 mm)
- EN 10225-1:2019 S420QLO or 1.8666 (200 mm)
- DNV NV EO690 and NV E690
- AB FQ70 Z35 (210 mm), AB EQ70 Z35 (254 mm)



## Heavy loaded mechanical parts

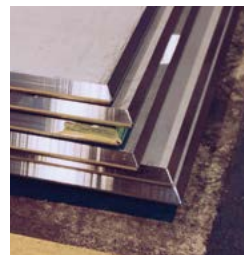
Industeel has extensive knowledge and experience in delivering heavy plates and blocks to be used for heavy loaded parts such as shafting or structural parts (keels, foils, ...) and offers numerous solutions from the beginning to the end of vessel production. ArcelorMittal Global R&D centres have also the possibility to perform all the mechanical fatigue and corrosion tests ensuring the full characterisation of the properties of the steels used for such parts.

## New carriers

Industeel pays a lot of attention to new developments and needs coming from emerging markets and thus is developing a full range of products for new applications:

- ultra cryogenic grades for deep cryogenic species, such as liquefied hydrogen (LH<sub>2</sub>),
- high strength pressure vessel grade with mild cryogenic resistance for CO<sub>2</sub> transportation at medium and low pressure,
- ammonia compliant cryogenic grade to enable flexi fuel motorisation or multi-carrier shipping systems.

By offering multiple options for multi-fuel tanks (LNG + ammonia by instance), Industeel can offer a flexible solution for ship refueling.

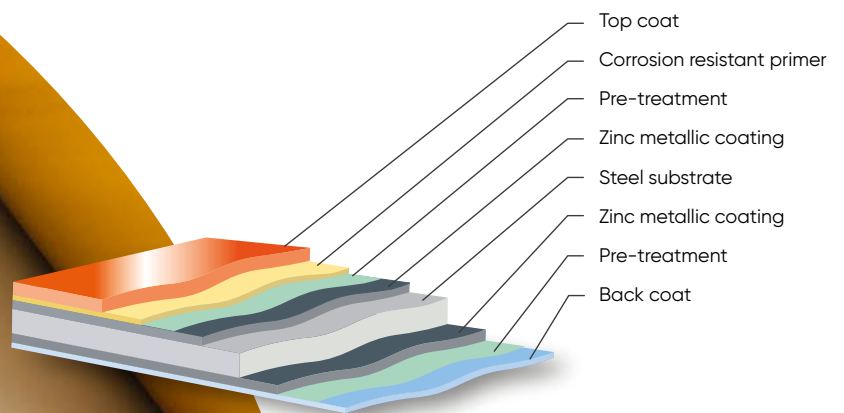




## Innovative cabin and interior solutions

Organic coated steels are adapted for shipbuilding cabins.

Our products and processes align to provide quality and aesthetic results for high-end cabin design.







# Organic coated steels: sustainable and resistant

## Sustainable

Organic coated steel is a sustainable product for paint application. Paint thickness is strictly controlled, and the optimised application process minimises the use of natural resources.

The development and use of sustainable solutions in shipbuilding is necessary to create a more sustainable future for the industry.

Organic coated steels combined with XCarb® dramatically reduce the CO<sub>2</sub>e emissions of shipbuilding.

Our XCarb® recycled and renewably produced offer combines a high level of recycled content with the use of green electricity, allowing ArcelorMittal to offer the most sustainable organic coated steel, fully processed in Europe.

More about XCarb®:

<https://europe.arcelormittal.com/sustainability/xcarb/xcarb-introduction>

## Resistant and robust

ArcelorMittal's organic coated steels can be used in various corrosive environments including seafront buildings, offshore platforms, and ships.

For ships, we can propose a range of solutions which ensure the robustness of cabin ceilings, doors, and partitions. These solutions include: paints with reinforced surface properties, laminated steels, and different textures.

Paints are applied on a metallic coated steel to ensure corrosion resistance. Every paint is certified for its fire reaction performance.

Our organic coated steels are tested and certified according to the EN10169 standard. They are classified up to RC5+ and RUV5.

## Aesthetics

ArcelorMittal's organic coated steels are available with a wide range of attractive aesthetics.

Depending on the interior atmosphere created by the designer, colours can be solid, metallised, or printed. Gloss levels can be matt, satin, or bright. Surfaces can be smooth, grained, or textured.



# XCarb<sup>®</sup>

Towards carbon neutral steel

**ArcelorMittal Europe aims to reduce Scope 1 and 2 CO<sub>2</sub> emissions by 35% by 2030, with a further ambition to be net zero by 2050.**

XCarb<sup>®</sup> is a trademark registered by ArcelorMittal. It represents the clear path taken by the company towards the decarbonisation of the steel production process and our ambitious goal of achieving zero emissions by 2050.

XCarb<sup>®</sup> brings together all of ArcelorMittal's reduced, low, and zero-carbon products and steelmaking activities, as well as wider initiatives and green innovation projects, into a single effort focused on achieving demonstrable progress towards carbon neutral steel.

ArcelorMittal has developed two decarbonised production routes (Smart Carbon route and innovative DRI route). We are currently deploying these low-emission technologies across Europe.

## XCarb<sup>®</sup> green steel certificates

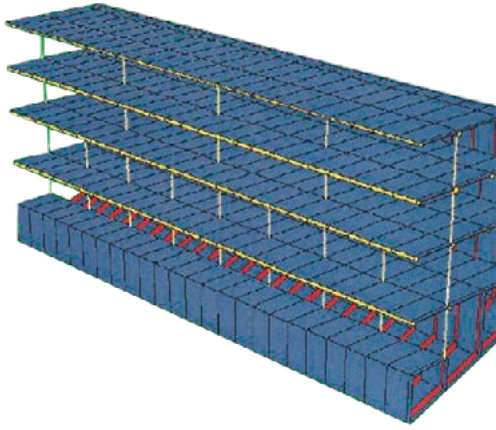
ArcelorMittal Europe – Flat Products is investing in a broad range of initiatives to reduce carbon emissions from the blast furnace. These first, effort-intensive investments on our journey to zero emission steels have resulted in considerable CO<sub>2</sub> savings. These savings are aggregated, independently verified, and converted into XCarb<sup>®</sup> green steel certificates.

The certificates allow customers to reduce the Scope 3 emissions of their own operations, or those of their customers. They can be purchased directly from ArcelorMittal Europe – Flat Products in conjunction with a corresponding steel order.

## XCarb<sup>®</sup> recycled and renewably produced

ArcelorMittal's XCarb<sup>®</sup> recycled and renewably produced steels are made in an electric arc furnace (EAF) using high levels of scrap and 100-percent renewable electricity. The electricity used comes from renewable sources such as wind and solar and is supplied via a recognised Guarantee of Origin (GoO) scheme.

ArcelorMittal's XCarb<sup>®</sup> recycled and renewably produced steels have a CO<sub>2</sub> footprint which is around 60-percent lower than steels produced via the conventional blast furnace production route.



# Logistic and technical support

## Value for our customers

ArcelorMittal has developed long and close relationships with most of the biggest shipbuilders in Europe. With our long experience in the sector, ArcelorMittal is a reliable and trusted partner for these companies.

We are committed to providing you with comprehensive commercial and technical support throughout your project. Our highly experienced customer support team is available at every stage and is fully dedicated to meet the most demanding customer requirements.

ArcelorMittal's delivery schedule is flexible and reliable. We can establish continuous and regular deliveries and manage urgent material requests during the ship's construction. Our production programming is flexible. However, it can be adapted to meet the engineering changes which may occur as construction advances. ArcelorMittal Distribution Solutions also plays an important role when shipbuilders require steels cut to length.

ArcelorMittal Europe – Flat Products' mills are committed to deliver all orders on time and in full. We understand that even one missing plate can threaten the on-time completion of a project.

## ArcelorMittal Global R&D

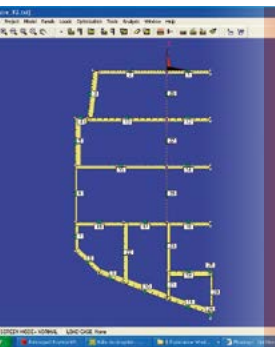
ArcelorMittal Global R&D includes more than 1,600 world-class researchers located at 14 laboratories around the world. Our experts in materials and welding can help you with tasks such as characterisation of materials and component testing.

ArcelorMittal Global R&D has a wealth of experience in structural design. Based on experimental tests and numerical modelling, our experts can help you to optimise the structure of your vessel. Structures made from our newly developed high strength steel grades enable greater spans and slender shapes.

ArcelorMittal Global R&D can perform orientation fire tests. The tests are conducted in accordance with the EN13501-1 standard and International Maritime Organization (IMO) rules.

A complete range of welding equipment is available at ArcelorMittal's Global R&D facilities. This includes laser, plasma, MIG/MAG, TIG, and Multi-wire Submerged Arc Welding (SAW) equipment.

Multi-wire Submerged Arc Welding (SAW)



## Logistic support:

- Bi-monthly deliveries to European shipyards using roll-on/roll-off (RORO) ships
- Truck shipment for urgent or special deliveries.





# ArcelorMittal: The reliable partner for the global shipbuilding industry

ArcelorMittal continuously works to exceed the high quality and service expectations of our customers, particularly in very competitive sectors such as the shipbuilding market.

From products to tailor-made services, ArcelorMittal is your global partner for any shipbuilding project. Our mills are strategically located and many have easy access to sea ports, ensuring low emissions during transport without loss of properties.

ArcelorMittal relies on the expertise of our Flat Products and Distribution Solutions divisions, R&D teams and a large network of agencies.

As an international company, ArcelorMittal is fully engaged in global efforts to reduce greenhouse gas emissions and mitigate their impact. Steel is fully and permanently recyclable and is the most recycled material globally. All recovered steels are recycled. Steel can be recycled indefinitely.

## We're here to help you

### Flat Products

[industry.arcelormittal.com](https://industry.arcelormittal.com)

### Distribution Solutions

[ds.arcelormittal.com](https://ds.arcelormittal.com)

### Industeel

[industeel.arcelormittal.com](https://industeel.arcelormittal.com)



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