

# Industeel

## Steel solutions for offshore structures



ArcelorMittal

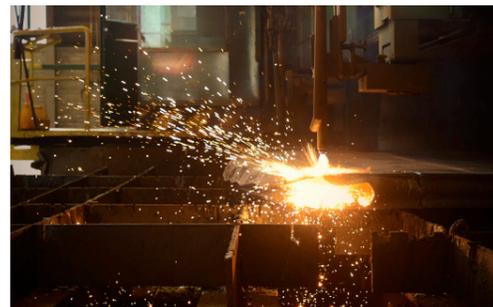


## Our products are made from recycled steel in an Electric Arc Furnace (EAF)

Industeel offers a complete range of high quality steel grades dedicated to the offshore structures market.

Our low carbon footprint EAF steelmaking route helps our customers to meet their carbon emission reduction targets.

- Strict chemical requirement thanks to use of high quality scraps
- Extra-clean steel ( $P < 0.007\%$  ;  $S < 0.005\%$  ;  $H_2 < 1 \text{ ppm}$ )
- Stringent UT guarantees and excellent internal soundness thanks to our 12 000 ton forging press and quarto plate rolling equipment
- Precise monitoring of heat treatment parameters to guarantee excellent homogeneity of mechanical properties
- Cut-to-size flame cutting and milling for tight tolerances and smooth surface condition



Our steel is made from recycled scrap

## A world leader in the fabrication of welded elements for jack-up rig legs



### Racks: flame-cut pieces made from top-quality quenched and tempered plates

- High tensile properties (YS > 690 MPa) and excellent toughness properties at mid-thickness down to -60°C along with improved weldability
- Very tight dimensional tolerances included on flatness (even narrower tolerances achievable by machining on request)

### Chords: hot formed pieces



- Quenched and tempered (following hot forming) with tight tolerances on width and height
- Mechanical properties (tensile, impact toughness) are achieved following hot forming and quality heat treatment (same guarantees as per racks)



### Welded elements: assembled from racks and chords

- Tolerances guaranteed on finished welded elements (as per client's requirements)
- Properties in HAZ and weld deposit metal homogeneous with base metal



Extra heavy plates  
of 60 MT\* unit weight  
and 4350 mm width

\* Metric tonnes

# Top quality material SuperElso® 690CR for the manufacturing jack-up rigs

SuperElso® 690CR is a 690 MPa (100 ksi) yield strength quenched and tempered steel developed for legs of offshore jack-up platforms.

This grade has been specially designed for offshore applications requiring the use of heavy thick plates (up to 254 mm/10") with demanding mechanical properties requirements.

The chemical composition of SuperElso® 690 CR has been carefully adapted and allows the achievement of high impact values (> 50 J at -60°C) across the thickness while respecting the tensile properties required.

The low carbon content of this material allows cutting and welding under classical conditions, optimizing in this way the cost efficiency of manufacturing.

### Key Benefits

- Good weldability
- Excellent impact toughness in HAZ\* in as welded conditions
- PWHT\*\* not necessary
- Resistant to hydrogen embrittlement under cathodic protection

\* Heat Affected Zone  
\*\* Post Weld Heat Treatment

# Approvals from classification societies for plates up to 254 mm thick (10")



Please use this QR Code to download our certifications.



## A complete range of high quality grades that meet the most stringent specifications

Industeel grades have been approved by Lloyd's, ABS and DNV institutes in a wide dimensional range.

Our manufacturing process allows us to reach excellent and homogeneous mechanical properties throughout the entire thickness.

Standard	Grade	Maximum thickness
EURONORM - EN 10025-6	S690 - Q/QL/QL1 S890 - Q/QL S960 - Q/QL	250 mm
EURONORM - EN 10225	S355 G10+N, S355 NLO S420 G1/G2+QT, S420 QLO S460 G1/G2+QT, S460 QLO	250 mm
ASTM	A 514 A to Q A 517 A to Q	11" (280 mm)
ABS	DH/EH 32-36 (N) EQ/FQ 51-56-70 (QT)	10" (250 mm) 8.3" (210 mm)
DNV	D/E 32-36 (N) EO690 (QT), E690 (QT) FO690 (QT)	250 mm 254 mm 215 mm
Lloyd's Register	AH / DH / EH / 32-36 (N)	400 mm



**50** steel specialists to  
guide your projects  
from A to Z

# More than 30 years of experience in the jack-up market

## Wind Turbines Installation Vessels (WTIV)

Installation of the new generation of offshore wind turbines requires XXL WTIVs using extra heavy gauges.

We have delivered extra heavy plates (up to 254 mm-thick) for manufacturing of racks with stringent requirements.

Thanks to our experience of more than 30 years on the jack-up market, we are a key supplier for jack-up rigs dedicated to WTIVs.

### References

#### Vessel Owners

- Cadeler (Denmark)
- Havfram (Norway)
- Maersk (Denmark)
- Van Oord (Netherlands)

#### Shipyards

- CIMC Raffles (China)
- CMHI (China)
- Sembcorp (Singapore)

#### Designers

- GustoMSC
- Sembcorp Marine



## Oil & Gas

About 200 000 tons of SuperElso® 690CR are present all around the world as jacking systems or jack-up legs.

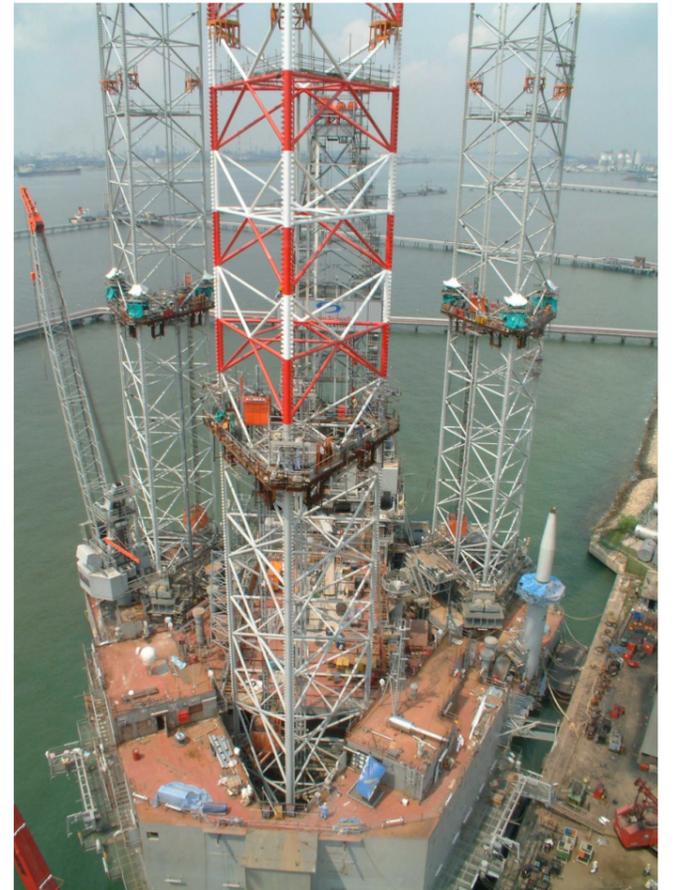
### References

#### Shipyards

- Jurong PPL, KFELS (Singapore)
- Letourneau (USA)
- Friede & Goldman (USA)
- Hyundai (South Korea)
- Dalian Shipbuilding Offshore Co. (China)
- ABG shipyard (India)

#### Designers

- Friede & Goldman : JU2000E, SUPER M2, JU2000A
- BMC : PACIFIC CLASS 375
- MSC : CJ70, CJ46
- KFELS : Mod V, Mod VI
- Technip : TPG 500





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# Smarter steels for people and planet

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