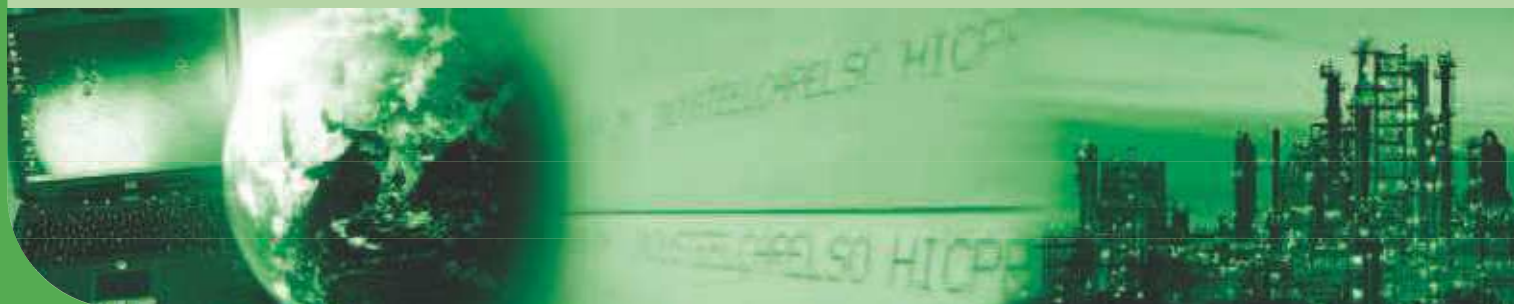


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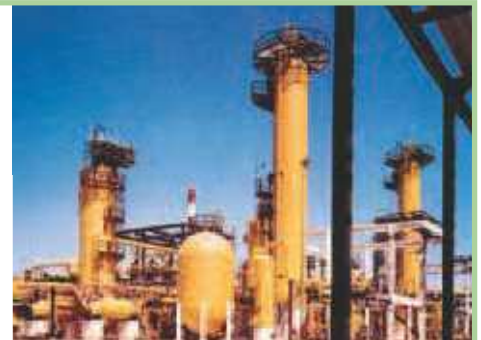
## CarElso<sup>®</sup> HIC Premium<sup>+</sup>

The genuine HIC resistant steel plates guaranteed to meet all specifications

# CarElso® HIC Premium+

The genuine HIC resistant steel plates guaranteed to meet all specifications

- Meets all leading oil & gas companies, engineering and process licensors pressure vessel steel specifications
- Meets NACE MR0175 / MR0103 requirements
- Enhanced weldability, low carbon equivalent
- Ex-stock availability with the largest available size range
- The full guarantee of the leading HIC resistant pressure vessel plates producer with more than 20 years experience



**NO COMPROMISE WITH SAFETY**

## Availability

- **Grades**

**Certification 3.2 as per EN 10204** : Industeel CarElso® HIC Premium+ is ASTM/ASME A/SA 516 grade 60/65/70 triple certified  
Third party is an internationally recognised body

- **Sizes**

Thickness 8 mm to 105 mm (6 mm possible on request), all positive tolerance, up to 4000 mm wide and 14000 mm long

# CarElso® HIC Premium+ Product characteristics

## Chemistry

- EAF steel making route, fully killed, vacuum degassed, fine grain practice
  - max Ceq 0.41% up to 50 mm, 0.43% above
  - max S .001%; P .008%; Nb .015%; V .005%; O .002%

Segregation mitigation during casting, deep deoxidation to avoid inclusions, no Ca treatment thanks to naturally low sulfur, ultralow phosphorus levels for enhanced in-service resistance

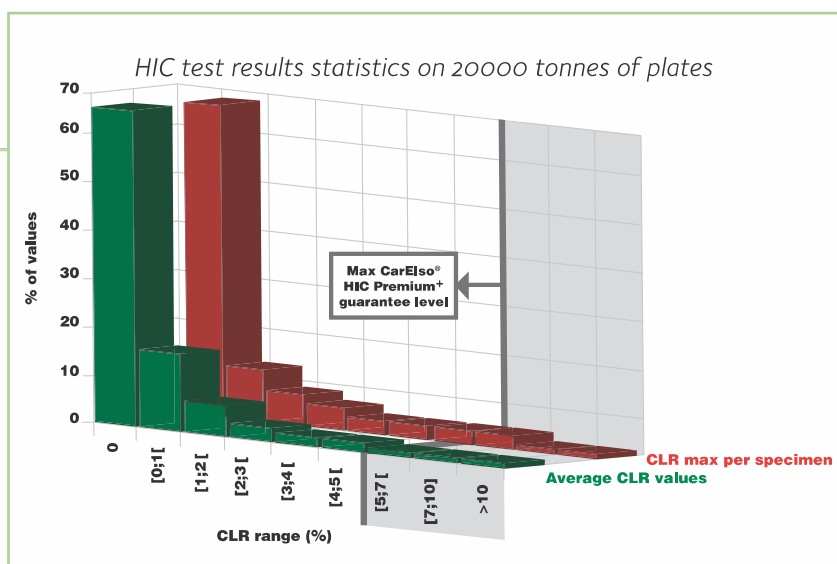


## Mechanical properties

- Mechanical test after simulated PWHT at 610°C 2 min/mm:
  - ambient tensile properties as per standard
- Charpy impact test longitudinal and transverse direction
  - at -51 °C for thickness ≤25 mm (20J/16J)
  - at -46 °C for thickness >25 mm (41J/34J)

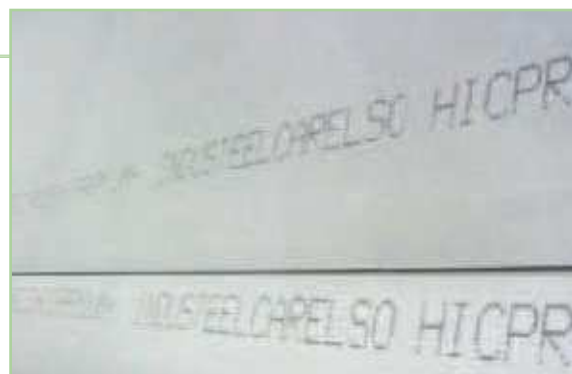
## HIC

- According to NACE MR0175/ISO15156-2 and NACE MR0103 (hardness <22HRC / 248HV10)
- HIC tested after simulated PWHT at 610 °C 2 min/mm:
  - as per NACE TM 0284-2003 solution A
  - per heat on thinnest and thickest plate
  - guarantee of max **CLR 5% CTR 1.5% CSR 0.5%**, on sample **average** and on each **individual** specimen, max crack length 5 mm on each section - on the entire available thickness range
  - ASTM E1268 microexamination on each HIC tested plate



## Delivery conditions

- General requirements as per ASME SA20
  - Normalized 920 °C
  - Ultrasonic testing control as per SA 578 level C
    - + 75 mm pitch scanning
    - + 100 mm<sup>2</sup> max defect area
  - Surface shotblasted to SA 2.5
  - Low-stress die stamping 2 locations: head and foot of plate
  - Identification paint marking one end + shipping marks
  - Continuous brand marked 2 long edges



## Compatibility with requirements

- Properties guaranteed up to maximum three cycles of PWHT
- Compatibility with most demanding specifications like Axens IN-43, EEMUA179, ENI CAL501S, Petrobras N-1706, Saudi Aramco 01-SAMSS-016, SHELL MESC74/125, SHELL DEP31.22.10.32, etc...
- HIC, SSC and other properties guaranteed by Industeel in PWHT condition on the full lots covered by the certification
  - SSC testing possible on request, material able to pass HIC re-test using dummy samples and several sampling locations
  - Ultrasonic testing quality compatible with EN 10160 S2E2



# ArcelorMittal

Industeel has references of CarElso® HIC resistant materials all around the world and supplies over 15000 tonnes yearly\*.



\* limited selection of references, this list is not exhaustive

**Industeel approved partner for**

**CarElso © HIC Premium+**

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