

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

INSPECTION CERTIFICATE N. **AC/ 4364** DATE : **05/12/18**  
according to EN 10234.3.1

FIRM :  
ORDER : **PO5378** ORDER CONFIRMATION : **206807**

| HEAT  | N. of PCS | MATERIAL DESCRIPTION  | MATERIAL GRADE  |
|-------|-----------|---|---|
| 63352 | 2         | FORGED ROUND PEELED BARS Ø17"<br><br>Lbs 10454,329 x 13,03478 feet<br>Lbs 11422,159 x 14,31759 feet | 316/316L<br>UNS S31600 /S31603<br>SS1 Rev.5.4<br>ASTM A276-17<br>ASTM A479-18<br>ASTM A484-18<br>ASME Code Sec.II Part. A SA479-17<br>AMS 5653H<br>AMS QQS 783D Cond.A<br>AMS 5648M<br>AMS S-7720 316<br>NACE MR 0103-2015<br>NACE MR 0175/ISO 15156-2015 |

H.T. CONDITION: Solution annealed 1050°C (8h) + water quenched

**HEAT ANALYSIS**

| C      | Mn    | Si    | P     | S      | Cr     | Ni                    | Mo                   | Cu    | Sn (ppm) |
|--------|-------|-------|-------|--------|--------|-----------------------|----------------------|-------|----------|
| 0,014  | 1,77  | 0,44  | 0,029 | 0,0214 | 16,66  | 10,84                 | 2,20                 | 0,433 | 79       |
| Ca     | Al    | V     | Ti    | W      | Ta     | As (ppm)              | Co                   | Nb    | Pb (ppm) |
| 0,0042 | 0,009 | 0,057 | 0,003 | 0,050  | 0,0018 | 51                    | 0,117                | 0,042 | <20      |
| B      | N     | Zr    | Sb    | Fe     | PRE    | Ferrite (%) ASTM E562 | Grain size ASTM E112 |       |          |
| 0,0003 | 0,067 |       |       |        |        |                       | 5                    |       |          |

**TEST RESULTS ON ACTUAL BAR PROLONGATION**

| Temp. [°C] | Direction | Rp0.2 [KSI] | Rm [KSI] | A [%] | Z [%] | KV (10 X 10 mm) [J] | Hardness           |
|------------|-----------|-------------|----------|-------|-------|---------------------|--------------------|
| RT         | L         | 42          | 78       | 59,2  | 80,1  |                     | HBw 162<br>HRc <22 |

Steelmaking process E.A.F. + A.O.D. refining  
No welding performed on material  
Material free from Mercury contamination  
Material inspected with a gamma spectrometer and with no radioactive contamination beyond the limits provided for by the EU-Radiation Protection 122- part 1, when relevant  
Mechanical tests performed according to ASTM A370-17a (Ø12,5mm-50mm length) + ASTM E10-17 + ASTM E18-18a  
Corrosion test according to ASTM A262 P1E satisfactory performed  
Chemical analysis and mechanical properties according to ASTM A182-18a-ASME SA182-17 (F316-F316L) - ASTM A193-17 - ASME SA193-17 (Grade B8M Class 1)  
Country of melt and country of manufacture: Italy  
Italfond is in compliance with DFARS regulation 252 225-7017  
Forging ratio 3,1:1  
PMI performed

| SURVEYORS | CUSTOMER INSPECTION | ITALFOND S.p.A.<br>Quality Assurance   |
|-----------|---------------------|--|
|           |                     | <br><b>CAPAZZA QUALITA'</b> |

CA48603 V3

ANS

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**  
**MICROGRAPHIC EXAMINATION**

INSPECTION CERTIFICATE N. **ME/ 4364** DATE : **05/12/18**  
 according to EN 10204.3.1

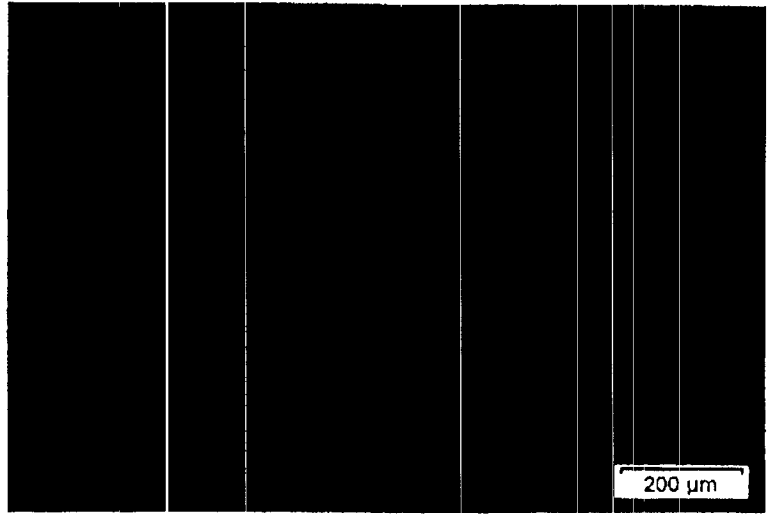
FIRM :  
 ORDER : **PO5378** ORDER CONFIRMATION: **206807**

| HEAT  | N. of PCS | MATERIAL DESCRIPTION  | MATERIAL GRADE  |
|-------|-----------|---|---|
| 63352 | 2         | FORGED ROUND PEELED BARS Ø17"<br><br>lbs 10454,329 x 13,03478 feet<br>lbs 11422,159 x 14,31759 feet | 316/316L<br>UNS S31600 /S31603<br>SS1 Rev.5.4<br>ASTM A276-17<br>ASTM A479-18<br>ASTM A484-18<br>ASME Code Sec.II Part. A SA479-17<br>AMS 5653H<br>AMS QQS 763D Cond.A<br>AMS 5648M<br>AMS S-7720 316<br>NACE MR 0103-2015<br>NACE MR 0175/ISO 15156-2015 |

H.T. CONDITION : Solution annealed 1050°C (8h) + water quenched

**MICROGRAPHIC EXAMINATION - MID RADIUS**

Magnification: 100 x  
 Etching: electrolytic, Oxalic Acid 3v 20s according to ASTM E407



RESULT: Omogeneous structure free from detrimental phases and precipitates

|           |                     |                                      |
|-----------|---------------------|--------------------------------------|
| SURVEYORS | CUSTOMER INSPECTION | ITALFOND S.p.A.<br>Quality Assurance |
|           |                     | <br><b>GARANZIA QUALITÀ</b>          |

CQAS 603 2/2

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**  
**MACROGRAPHIC EXAMINATION**

INSPECTION CERTIFICATE N. **ME2/ 4364** DATE : **05/12/18**  
 according to EN 10204.3.1

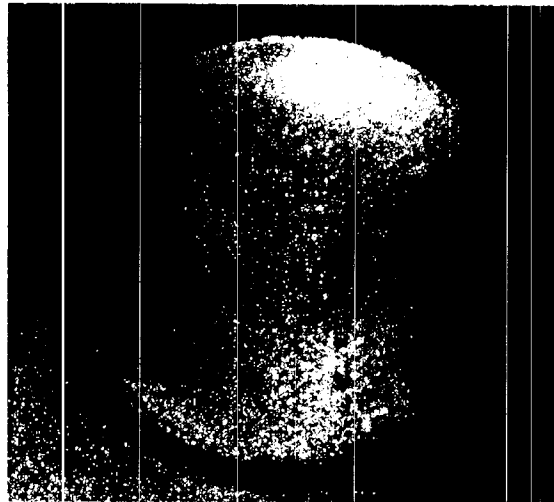
FIRM :  
 ORDER : **P05378** ORDER CONFIRMATION: **206807**

| HEAT  | N. of PCS | MATERIAL DESCRIPTION  | MATERIAL GRADE  |
|-------|-----------|---|---|
| 63352 | 2         | FORGED ROUND PEELED BARS Ø17"<br><br>Lbs 10454,329 x 13,03478 feet<br>Lbs 11422,159 x 14,31759 feet | 316/316L<br>UNS S31600 /S31603<br>SS1 Rev.5.4<br>ASTM A276-17<br>ASTM A479-18<br>ASTM A484-18<br>ASME Code Sec.II Part. A SA479-17<br>AMS 5653H<br>AMS QQS 763D Cond.A<br>AMS 5648M<br>AMS S-7720 316<br>NACE MR 0103-2015<br>NACE MR 0175/ISO 15156-2015 |

H.T. CONDITION : Solution annealed 1050°C (8h) + water quenched

**MACROGRAPHIC EXAMINATION**

Etching: Aquaregia



|           |                     |                                      |
|-----------|---------------------|--------------------------------------|
| SURVEYORS | CUSTOMER INSPECTION | ITALFOND S.p.A.<br>Quality Assurance |
|           |                     | <br><b>CARANZIA QUALITÀ</b>          |

C248603 3/3