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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------|------------|
| <b>Type of inspection document :</b><br>Inspection certificate acc. to EN 10204 / 3.1                                                                                                                                                                                                                                                                     | A02                | <b>Internal order No.:</b><br>10059512 - 60                                                                          | A08        |
| <b>Purchaser :</b><br>ALLEIMA BENELUX B.V.<br>.<br>AMUNDSENWEG 4<br>5928 LT VENLO<br>THE NETHERLANDS                                                                                                                                                                                                                                                      | A06                | <b>Purchase order No. :</b><br>800763<br><b>Purchaser's reference :</b><br>800763<br><b>Project Id. :</b><br>4003390 | A07        |
| <b>Product :</b><br>Seamless cold finished tube<br><b>Dimension (OD x WT) :</b><br>8,00 x 1,00AW mm                                                                                                                                                                                                                                                       | B01/B04<br>B09/B10 | <b>Steel designation :</b><br>3R60 / 3R60<br><b>Melting process :</b><br>AOD                                         | B02<br>C70 |
| <b>Technical requirements :</b><br>ASME SA213/SA213M-2021<br>ASTM A213/A213M-2022<br>ASTM A269/A269M-2015a (Reap.2019)<br>EN 10216-5 TC1 2021<br>EN 10305-1 (Only Tolerances-Table 5)<br>AD 2000 W2 Einbaurohre - 2022<br>AD 2000 W10 - 2019<br>NACE MR0175-2021/ISO 15156-3:2020, NACE MR0103/ISO 17945-1:2016<br>Alleima SPEC S-08921<br>PED 2014/68/EU |                    |                                                                                                                      | B03        |
| <b>Supplementary information :</b><br>Manufacturing of stainless steel tubes in grade 3R60 / TP316L / UNS S31603 / 1.4435 from steel origin:<br>Alleima Tube AB, Sweden.<br>The qualified pre-material supplier is mentioned in the section "Extent of material delivery".<br>Tube lenght 6000 mm (-0/+5 mm)                                              |                    |                                                                                                                      | B14        |
| The products, covered by this certificate, comply with specification and requirements of the order.                                                                                                                                                                                                                                                       |                    |                                                                                                                      | Z01        |
| <b>Originator of the document :</b><br>QA - AC                                                                                                                                                                                                                                                                                                            | A05/Z02            | <b>Inspector's stamp:</b>                                                                                            | Z03        |

**Chemical composition (Heat analysis)**

| Heat   | C<br>[%]           | Si<br>[%]          | Mn<br>[%]          | P<br>[%]           | S<br>[%]           |
|--------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 567782 | max 0.030<br>0,019 | max 1.000<br>0,380 | max 2.000<br>1,550 | max 0.040<br>0,028 | max 0.015<br>0,008 |

  

| Heat   | Cr<br>[%]               | Ni<br>[%]               | Mo<br>[%]            | N<br>[%]           |
|--------|-------------------------|-------------------------|----------------------|--------------------|
| 567782 | 17.000-18.000<br>17,290 | 12.500-14.000<br>13,110 | 2.500-3.000<br>2,620 | max 0.100<br>0,034 |

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**Product check analysis**

| Heat   | Lot        | C<br>[%]  | Si<br>[%] | Mn<br>[%] | P<br>[%]  | S<br>[%]  |
|--------|------------|-----------|-----------|-----------|-----------|-----------|
|        |            | max 0.030 | max 1.000 | max 2.000 | max 0.040 | max 0.015 |
| 567782 | 2093566-11 | 0,019     | 0,380     | 1,550     | 0,027     | 0,005     |

| Heat   | Lot        | Cr<br>[%]     | Ni<br>[%]     | Mo<br>[%]   | N<br>[%]  |
|--------|------------|---------------|---------------|-------------|-----------|
|        |            | 17.000-18.000 | 12.500-14.000 | 2.500-3.000 | max 0.100 |
| 567782 | 2093566-11 | 17,490        | 12,570        | 2,540       | 0,042     |

**Extent of material delivery**

| Heat   | Lot        | Hollow supp. | No. of HTcycles <sup>1)</sup> | Pieces | Total length [m] | Total weight [kg] <sup>2)</sup> |
|--------|------------|--------------|-------------------------------|--------|------------------|---------------------------------|
| 567782 | 2093565-11 | ALLEIMA SE   | 1                             | 1 416  | 8 496.000        | 1 486.800                       |
| 567782 | 2093566-11 | ALLEIMA SE   | 1                             | 1 405  | 8 430.000        | 1 475.250                       |

Note : <sup>1)</sup> Number of heat treatment cycles performed on the tubes.<sup>2)</sup> Weight quantity is theoretically calculated, it might differ compared to shipping documents.

Chomutov, date : 17.4.2023

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**Flaring test in acc. with ASTM A 1016**

| Heat   | Lot        | ST | Test result<br>[pass/fail] |
|--------|------------|----|----------------------------|
|        |            |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |

**Flaring test in acc. with EN 10216-5**

| Heat   | Lot        | ST | Test result<br>[pass/fail] |
|--------|------------|----|----------------------------|
|        |            |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |

**Flattening test in acc. with ASTM A 1016**

| Heat   | Lot        | ST | Test result<br>[pass/fail] |
|--------|------------|----|----------------------------|
|        |            |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |

**Hardness test (HRB/HRC) in acc. with E18/S-08921/NACE**

| Heat   | Lot        | ST | Hardness<br>[HRB] | Hardness $\leq 22\text{HRC}$<br>[yes/no] |
|--------|------------|----|-------------------|------------------------------------------|
|        |            |    | max 80,000        | yes                                      |
| 567782 | 2093565-11 |    | 69,000            | yes                                      |
| 567782 | 2093565-11 |    | 69,000            | yes                                      |
| 567782 | 2093566-11 |    | 68,000            | yes                                      |
| 567782 | 2093566-11 |    | 69,000            | yes                                      |

**Intergranular corrosion testing in acc. with ASTM A262E**

| Heat   | Lot        | ST | Test result<br>[pass/fail] |
|--------|------------|----|----------------------------|
|        |            |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |

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### Intergranular corrosion testing in acc. with EN ISO 3651-2/A

| Heat   | Lot        | ST | Test result<br>[pass/fail] |
|--------|------------|----|----------------------------|
|        |            |    | pass                       |
| 567782 | 2093565-11 |    | pass                       |
| 567782 | 2093566-11 |    | pass                       |

### Longitudinal tensile test in acc. with A370 / EN ISO 6892-1

| Heat   | Lot        | ST | Rp0,2<br>[MPa] | Rm<br>[MPa]     | A2"<br>[%] | A5<br>[%]  | Rp1,0<br>[MPa] |
|--------|------------|----|----------------|-----------------|------------|------------|----------------|
|        |            |    | min 220,000    | 515,000-690,000 | min 35,000 | min 40,000 | min 250,000    |
| 567782 | 2093565-11 |    | 278,600        | 568,300         | 52,000     | 62,000     | 319,100        |
| 567782 | 2093566-11 |    | 291,000        | 584,100         | 49,000     | 54,400     | 333,600        |

### Microstructure evaluation and Grain size WI-3815/ASTM E112

The structure is free from grain boundary chromium carbide precipitations.

| Heat   | Lot        | ST | G.B.Cr.Carbides<br>[No/Yes] | Grain size<br>[(G)] |
|--------|------------|----|-----------------------------|---------------------|
|        |            |    | No                          | 5,000-14,000        |
| 567782 | 2093565-11 |    | No                          | 6,000               |
| 567782 | 2093566-11 |    | No                          | 6,000               |

### Dimensional check

Test results comply with specified criteria.

### HT - Final heat treatment of straight tubes

Bright annealing at 1150°C with min. 0,25 minute holding time.

Quenched by forced cooled inert gas.

### Inside cleanliness check

Test results comply with specified criteria.

### NDT - Eddy current flaw detection in acc. ASTM E426

Test results comply with specified criteria.

### NDT - Visual inspection

Test results comply with specified criteria.

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**PMI - 100% positive material identification**

Test results comply with specified criteria.

**Statement**

The raw material is free from radioactive contamination.

**Statement**

Material free from mercury and asbestos contamination.

**Statement**

The material have been manufactured within the scope of certified Quality Management System maintained in accordance with EN ISO 9001:2015.

**Straightness check**

Test results comply with specified criteria.