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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>10060668 - 20                                                                          | 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>800776<br><b>Purchaser's reference :</b><br>800776<br><b>Project Id. :</b><br>4003410 | A07 |
| <b>Product :</b><br>Seamless cold finished tube                                                                                                                                                                                                                                                                                                                | B01/B04 | <b>Steel designation :</b><br>3R60 / 3R60                                                                            | B02 |
| <b>Dimension (OD x WT) :</b><br>25,40 x 2,41AW mm                                                                                                                                                                                                                                                                                                              | B09/B10 | <b>Melting process :</b><br>AOD                                                                                      | C70 |
| <b>Technical requirements :</b><br>ASME SA-213/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 17945-1:2015<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>[%]           |
|--------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 568274 | max 0.030<br>0,021 | max 1.000<br>0,400 | max 2.000<br>1,770 | max 0.040<br>0,029 | max 0.015<br>0,007 |

| Heat   | Cr<br>[%]               | Ni<br>[%]               | Mo<br>[%]            | N<br>[%]           |
|--------|-------------------------|-------------------------|----------------------|--------------------|
| 568274 | 17.000-18.000<br>17,400 | 12.500-14.000<br>13,110 | 2.500-3.000<br>2,630 | max 0.100<br>0,043 |

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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 |
| 568274 | 2101490-11 | 0,018     | 0,420     | 1,820     | 0,027     | 0,006     |

| 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 |
| 568274 | 2101490-11 | 17,430        | 13,100        | 2,540       | 0,032     |

### Extent of material delivery

| Heat   | Lot        | Hollow supp. | No. of HTcycles <sup>1)</sup> | Pieces | Total length [m] | Total weight [kg] <sup>2)</sup> |
|--------|------------|--------------|-------------------------------|--------|------------------|---------------------------------|
| 568274 | 2101490-11 | ALLEIMA SE   | 1                             | 119    | 714.000          | 986.748                         |

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 : 13.7.2023

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

| Heat   | Lot        | ST  | Test result<br>[pass/fail] |
|--------|------------|-----|----------------------------|
|        |            |     | pass                       |
| 568274 | 2101490-11 | EnF | pass                       |
| 568274 | 2101490-11 | WnF | pass                       |

ST (sample type): WnF-West end, tube did not not used for flattening test,Enf-East end, tube did not not used for flattening test;

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

| Heat   | Lot        | Test result<br>[pass/fail] |
|--------|------------|----------------------------|
|        |            | pass                       |
| 568274 | 2101490-11 | pass                       |

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

| Heat   | Lot        | ST | Test result<br>[pass/fail] |
|--------|------------|----|----------------------------|
|        |            |    | pass                       |
| 568274 | 2101490-11 | E  | pass                       |
| 568274 | 2101490-11 | W  | pass                       |

ST (sample type): E-East end of tube; W-West end of tube;

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

| Heat   | Lot        | Hardness<br>[HRB] | Hardness $\leq 22\text{HRC}$<br>[yes/no] |
|--------|------------|-------------------|------------------------------------------|
|        |            | max 80,000        | yes                                      |
| 568274 | 2101490-11 | 77,000            | yes                                      |
| 568274 | 2101490-11 | 77,000            | yes                                      |

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

| Heat   | Lot        | Test result<br>[pass/fail] |
|--------|------------|----------------------------|
|        |            | pass                       |
| 568274 | 2101490-11 | pass                       |

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

| Heat   | Lot        | Test result<br>[pass/fail] |
|--------|------------|----------------------------|
|        |            | pass                       |
| 568274 | 2101490-11 | pass                       |

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

| Heat   | Lot        | Rp0,2<br>[MPa] | Rm<br>[MPa]     | A2"<br>[%] | Amb.temper.<br>[°C] | A5<br>[%]  |
|--------|------------|----------------|-----------------|------------|---------------------|------------|
|        |            | min 220,000    | 515,000-690,000 | min 35,000 | 10,000-35,000       | min 40,000 |
| 568274 | 2101490-11 | 266,200        | 565,800         | 56,000     | 24,000              | 46,400     |
| 568274 | 2101490-11 | 267,200        | 565,000         | 56,600     | 24,000              | 47,500     |

| Heat   | Lot        | Rp1,0<br>[MPa] |
|--------|------------|----------------|
|        |            | min 250,000    |
| 568274 | 2101490-11 | 303,900        |
| 568274 | 2101490-11 | 301,900        |

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

The structure is free from grain boundary chromium carbide precipitations.

| Heat   | Lot        | G.B.Cr.Carbides<br>[No/Yes] | Grain size<br>[(G)] |
|--------|------------|-----------------------------|---------------------|
|        |            | No                          | 5,000-14,000        |
| 568274 | 2101490-11 | No                          | 6,000               |

### Dimensional check

Test results comply with specified criteria.

### HT - Final heat treatment of straight tubes

All tubes have been be solution annealed followed by accelerated cooling.

Solution annealing temperature 1090°C, soaking time min. 2 minutes.

Quench medium - protective 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.

### PMI - 100% positive material identification

Test results comply with specified criteria.

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**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.