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|--|---------|--|-----|
| Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1 | A02 | Internal order No.: 10050759 - 60 | A08 |
| Purchaser : ALLEIMA BENELUX B.V. . AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS | A06 | Purchase order No. : 800745 Purchaser's reference : 800745 Project Id. : 4003215 | A07 |
| Product : Seamless cold finished tube Dimension (OD x WT) : 12,00 x 1,00AW mm | B01/B04 | Steel designation : 3R60 / 3R60 Melting process : AOD | B02 |
| Technical requirements : ASME SA 213/SA213M-2021 ASTM A213/A213M-2022 ASTM A269/A269M-2015a (Reap.2019) EN 10216-5 TC1 2021 EN 10305-1 (Only Tolerances-Table 5) PED 2014/68/EU Alleima SPEC S-08921 AD 2000 W2 Einbaurohre - 2016 AD 2000 W10 - 2019 | | | B03 |
| Supplementary information : Manufacturing of stainless steel tubes in grade 3R60 / TP316L / UNS S31603 / 1.4435 from steel origin: Alleima Tube AB, Sweden. The qualified pre-material supplier is mentioned in the section "Extent of material delivery". Tube length 6000 mm (-0/+5 mm) | | | B14 |
| The products, covered by this certificate, comply with specification and requirements of the order. | | | Z01 |
| Originator of the document : QA - AC | A05/Z02 | Inspector's stamp: | Z03 |

Chemical composition (Heat analysis)

| Heat | C [%] | Si [%] | Mn [%] | P [%] | S [%] |
|--------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 567122 | max 0.030 0,020 | max 1.000 0,440 | max 2.000 1,600 | max 0.040 0,031 | max 0.015 0,009 |

| Heat | Cr [%] | Ni [%] | Mo [%] | N [%] |
|--------|-------------------------|-------------------------|----------------------|--------------------|
| 567122 | 17.000-18.000 17,240 | 12.500-14.000 13,110 | 2.500-3.000 2,620 | max 0.100 0,041 |

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Product check analysis

| Heat | Lot | C [%] | Si [%] | Mn [%] | P [%] | S [%] |
|--------|------------|-----------|-----------|-----------|-----------|-----------|
| | | max 0.030 | max 1.000 | max 2.000 | max 0.040 | max 0.015 |
| 567122 | 2085512-11 | 0,019 | 0,430 | 1,610 | 0,033 | 0,008 |

| Heat | Lot | Cr [%] | Ni [%] | Mo [%] | N [%] |
|--------|------------|---------------|---------------|-------------|-----------|
| | | 17.000-18.000 | 12.500-14.000 | 2.500-3.000 | max 0.100 |
| 567122 | 2085512-11 | 17,170 | 12,840 | 2,540 | 0,045 |

Extent of material delivery

| Heat | Lot | Hollow supp. | No. of HTcycles ¹⁾ | Pieces | Total length [m] | Total weight [kg] ²⁾ |
|--------|------------|--------------|-------------------------------|--------|------------------|---------------------------------|
| 567122 | 2075050-11 | ALLEIMA SE | 1 | 431 | 2 586.000 | 708.564 |
| 567122 | 2085511-11 | ALLEIMA SE | 1 | 351 | 2 106.000 | 577.044 |
| 567122 | 2085512-11 | ALLEIMA SE | 1 | 459 | 2 754.000 | 754.596 |
| 567122 | 2085513-11 | ALLEIMA SE | 1 | 301 | 1 806.000 | 494.844 |
| 567122 | 2085514-11 | ALLEIMA SE | 1 | 458 | 2 748.000 | 752.952 |
| 567122 | 2085515-11 | ALLEIMA SE | 1 | 473 | 2 838.000 | 777.612 |

Note : ¹⁾ Number of heat treatment cycles performed on the tubes.

²⁾ Weight quantity is theoretically calculated, it might differ compared to shipping documents.

Chomutov, date : 8.2.2023

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Flaring test in acc. with ASTM A 1016

| Heat | Lot | ST | Test result [pass/fail] |
|--------|------------|----|----------------------------|
| | | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085515-11 | | pass |
| 567122 | 2085515-11 | | pass |

Flaring test in acc. with EN 10216-5

| Heat | Lot | ST | Test result [pass/fail] |
|--------|------------|----|----------------------------|
| | | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085515-11 | | pass |

Flattening test in acc. with ASTM A 1016

| Heat | Lot | ST | Test result [pass/fail] |
|--------|------------|----|----------------------------|
| | | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085515-11 | | pass |
| 567122 | 2085515-11 | | pass |

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Hardness test (HRB) in acc. with ASTM E18 / 7-2-1261

| Heat | Lot | ST | Hardness |
|--------|------------|----|------------|
| | | | [HRB] |
| | | | max 80,000 |
| 567122 | 2075050-11 | | 79,000 |
| 567122 | 2075050-11 | | 77,000 |
| 567122 | 2085511-11 | | 77,000 |
| 567122 | 2085511-11 | | 78,000 |
| 567122 | 2085512-11 | | 78,000 |
| 567122 | 2085512-11 | | 76,000 |
| 567122 | 2085513-11 | | 79,000 |
| 567122 | 2085513-11 | | 78,000 |
| 567122 | 2085514-11 | | 77,000 |
| 567122 | 2085514-11 | | 77,000 |
| 567122 | 2085515-11 | | 77,000 |
| 567122 | 2085515-11 | | 77,000 |

Intergranular corrosion testing in acc. with ASTM A262E

| Heat | Lot | ST | Test result |
|--------|------------|----|-------------|
| | | | [pass/fail] |
| | | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085515-11 | | pass |

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

| Heat | Lot | ST | Test result |
|--------|------------|----|-------------|
| | | | [pass/fail] |
| | | | pass |
| 567122 | 2075050-11 | | pass |
| 567122 | 2085511-11 | | pass |
| 567122 | 2085512-11 | | pass |
| 567122 | 2085513-11 | | pass |
| 567122 | 2085514-11 | | pass |
| 567122 | 2085515-11 | | pass |

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

| Heat | Lot | ST | Rp0,2 | Rm | A2" | A5 | Rp1,0 |
|--------|------------|----|-------------|-----------------|------------|------------|-------------|
| | | | [MPa] | [MPa] | [%] | [%] | [MPa] |
| | | | min 220,000 | 515,000-690,000 | min 35,000 | min 40,000 | min 250,000 |
| 567122 | 2075050-11 | | 336,400 | 619,400 | 58,300 | 63,600 | 370,100 |
| 567122 | 2085511-11 | | 329,300 | 608,600 | 61,500 | 71,100 | 358,500 |
| 567122 | 2085512-11 | | 306,900 | 580,700 | 58,400 | 63,700 | 337,200 |
| 567122 | 2085513-11 | | 326,400 | 606,900 | 55,800 | 60,600 | 359,400 |
| 567122 | 2085514-11 | | 306,400 | 599,300 | 65,100 | 69,900 | 341,000 |
| 567122 | 2085515-11 | | 314,900 | 601,000 | 62,600 | 65,700 | 349,000 |

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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 | Grain size |
|--------|------------|----|-----------------|--------------|
| | | | [No/Yes] | [(G)] |
| | | | No | 5,000-14,000 |
| 567122 | 2075050-11 | | No | 7,000 |
| 567122 | 2085511-11 | | No | 7,000 |
| 567122 | 2085512-11 | | No | 6,000 |
| 567122 | 2085513-11 | | No | 7,000 |
| 567122 | 2085514-11 | | No | 7,000 |
| 567122 | 2085515-11 | | 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.

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.

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Straightness check

Test results comply with specified criteria.