

<b>Type of inspection document :</b> Inspection certificate acc. to EN 10204 / 3.1	A02	<b>Internal order No.:</b> 10079340 - 130	A08
<b>Purchaser :</b> ALLEIMA BENELUX B.V. . AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS	A06	<b>Purchase order No. :</b> 800835  <b>Purchaser's reference :</b> 800835  <b>Project Id. :</b> 4003729	A07
<b>Product :</b> Seamless cold finished tube	B01/B04	<b>Steel designation :</b> 3R60 / 3R60	B02
<b>Dimension (OD x WT) :</b> 6,00 x 1,00AW mm	B09/B10	<b>Melting process :</b> AOD	C70
<b>Technical requirements :</b> ASME SA213/SA213M-2023 ASTM A213/A213M-2022 ASTM A269/A269M-2015a (Reap.2019) EN 10216-5 TC1 2021 EN 10305-1 (Only Tolerances-Table 5) AD 2000 W2 Einbaurohre - 2022 AD 2000 W10 - 2019 NACE MR0175-2021/ISO 15156-3:2020, NACE MR0103/ISO 17945-1:2015 Alleima SPEC S-08921 PED 2014/68/EU			B03
<b>Supplementary information :</b> Manufacturing of stainless steel tubes in grade 3R60 / TP316/316L / 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
<b>Originator of the document :</b> QA - AC	A05/Z02	<b>Inspector's stamp:</b>	Z03

**Chemical composition (Heat analysis)**

Heat	C [%]	Si [%]	Mn [%]	P [%]	S [%]
570078	max 0.030 0,018	max 1.000 0,380	max 2.000 1,680	max 0.040 0,028	max 0.015 0,008

Heat	Cr [%]	Ni [%]	Mo [%]	N [%]	Co [%]
570078	17.000-18.000 17,320	12.500-14.000 13,090	2.500-3.000 2,640	max 0.100 0,038	info 0,097

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Heat	Ti [%] info
570078	<0,003

**Product check analysis**

Heat	Lot	C [%] max 0.030	Si [%] max 1.000	Mn [%] max 2.000	P [%] max 0.040	S [%] max 0.015
570078	2130106-11	0,017	0,400	1,760	0,028	0,007

Heat	Lot	Cr [%] 17.000-18.000	Ni [%] 12.500-14.000	Mo [%] 2.500-3.000	N [%] max 0.100
570078	2130106-11	17,580	12,660	2,550	0,007

**Extent of material delivery**

Heat	Lot	Hollow supp.	No. of HTcycles <sup>1)</sup>	Pieces	Total length [m]	Total weight [kg] <sup>2)</sup>
570078	2130106-11	ALLEIMA SE	1	2 124	12 744.000	1 593.000
570078	2130107-11	ALLEIMA SE	1	2 093	12 558.000	1 569.750
570078	2130108-11	ALLEIMA SE	1	1 114	6 684.000	835.500

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 : 19.4.2024

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570078	2130106-11		pass
570078	2130106-11		pass
570078	2130107-11		pass
570078	2130107-11		pass
570078	2130108-11		pass
570078	2130108-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570078	2130106-11		pass
570078	2130107-11		pass
570078	2130108-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570078	2130106-11		pass
570078	2130106-11		pass
570078	2130107-11		pass
570078	2130107-11		pass
570078	2130108-11		pass
570078	2130108-11		pass

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

Heat	Lot	ST	Hardness	Hardness $\leq 22$ HRC
			[HRB]	[yes/no]
			max 80,000	yes
570078	2130106-11		73,000	yes
570078	2130106-11		73,000	yes
570078	2130107-11		72,000	yes
570078	2130107-11		71,000	yes
570078	2130108-11		73,000	yes
570078	2130108-11		72,000	yes

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570078	2130106-11		pass
570078	2130107-11		pass
570078	2130108-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570078	2130106-11		pass
570078	2130107-11		pass
570078	2130108-11		pass

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

Heat	Lot	ST	Rp0,2 [MPa]	Rm [MPa]	A2" [%]	A5 [%]	Rp1,0 [MPa]
			min 220,000	515,000-690,000	min 35,000	min 40,000	min 250,000
570078	2130106-11		314,100	573,800	47,400	58,200	347,200
570078	2130107-11		295,200	567,600	49,200	66,000	330,300
570078	2130108-11		277,400	580,300	46,000	52,000	349,100

**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 [No/Yes]	Grain size [(G)]
			No	5,000-14,000
570078	2130106-11		No	7,000
570078	2130107-11		No	6,000
570078	2130108-11		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. E426/EN ISO 10893-1**

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.