

<b>Type of inspection document :</b> Inspection certificate acc. to EN 10204 / 3.1	A02	<b>Internal order No.:</b> 10056570 - 10	A08
<b>Purchaser :</b> ALLEIMA TUBE AB JARNVERKSLEDEN 8/CU NIKLAS PALMBLAD PHN; 4626265510 SE-811 81 SANDVIKEN SWEDEN	A06	<b>Purchase order No. :</b> 140296-2 STD <b>Purchaser's reference :</b> 140296-2 STD <b>Project Id. :</b> 4003338	A07
<b>Product :</b> Seamless cold finished tube	B01/B04	<b>Steel designation :</b> 3R60 / 3R60	B02
<b>Dimension (OD x WT) :</b> 8,00 x 1,00AW mm	B09/B10	<b>Melting process :</b> AOD	C70
<b>Technical requirements :</b> ASME SA213/SA213M-2021 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 / 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 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> QA - AC	A05/Z02	<b>Inspector's stamp:</b>	Z03

### Chemical composition (Heat analysis)

Heat	C [%]	Si [%]	Mn [%]	P [%]	S [%]
	max 0.030	max 1.000	max 2.000	max 0.040	max 0.015
567917	0,020	0,390	1,620	0,029	0,006
568033	0,019	0,400	1,650	0,028	0,007

  

Heat	Cr [%]	Ni [%]	Mo [%]	N [%]
	17.000-18.000	12.500-14.000	2.500-3.000	max 0.100
567917	17,200	13,120	2,620	0,038
568033	17,300	13,330	2,620	0,049

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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
567917	2099006-11	0,018	0,390	1,660	0,028	0,003
568033	2099007-11	0,019	0,410	1,670	0,029	0,006

Heat	Lot	Cr [%]	Ni [%]	Mo [%]	N [%]
		17.000-18.000	12.500-14.000	2.500-3.000	max 0.100
567917	2099006-11	17,330	13,010	2,540	0,018
568033	2099007-11	17,270	13,100	2,540	0,019

**Extent of material delivery**

Heat	Lot	Hollow supp.	No. of HTcycles <sup>1)</sup>	Pieces	Total length [m]	Total weight [kg] <sup>2)</sup>
567917	2099006-11	ALLEIMA SE	1	632	3 792.000	663.600
568033	2099007-11	ALLEIMA SE	1	1 145	6 870.000	1 202.250

**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 :** 20.6.2023

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

Heat	Lot	ST	Test result [pass/fail]
			pass
567917	2099006-11		pass
567917	2099006-11		pass
568033	2099007-11		pass
568033	2099007-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
567917	2099006-11		pass
568033	2099007-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
567917	2099006-11		pass
567917	2099006-11		pass
568033	2099007-11		pass
568033	2099007-11		pass

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

Heat	Lot	ST	Hardness [HRB]	Hardness $\leq$ 22HRC [yes/no]
			max 80,000	yes
567917	2099006-11		70,000	yes
567917	2099006-11		70,000	yes
568033	2099007-11		72,000	yes
568033	2099007-11		71,000	yes

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

Heat	Lot	ST	Test result [pass/fail]
			pass
567917	2099006-11		pass
568033	2099007-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
567917	2099006-11		pass
568033	2099007-11		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]
567917	2099006-11		287,900	561,600	52,600	53,200	317,700
568033	2099007-11		293,300	562,100	47,000	59,600	327,500

**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)]
567917	2099006-11		No	6,000
568033	2099007-11		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.