

<b>Type of inspection document :</b> Inspection certificate acc. to EN 10204 / 3.1	A02	<b>Internal order No.:</b> 10075345 - 60	A08
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<b>Purchaser :</b> ALLEIMA BENELUX B.V.  AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS	A06	<b>Purchase order No. :</b> 800816  <b>Purchaser's reference :</b> 800816  <b>Project Id. :</b> 4003661	A07
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<b>Product :</b> Seamless cold finished tube	B01/B04	<b>Steel designation :</b> 3R60 / 3R60	B02
<b>Dimension (OD x WT) :</b> 10,00 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
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<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 lenght 6000 mm (-0/+5 mm)			B14
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The products, covered by this certificate, comply with specification and requirements of the order.			Z01
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<b>Originator of the document :</b> QA - AC	A05/Z02	<b>Inspector's stamp:</b> 	Z03
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Digitally signed by Soňa Müllerová  
DN: cn=Soňa Müllerová, o=Soňa Müllerová, ou=CZ, Czech Republic, c=CZ, Czech Republic, email=soňa.mullerova@alleima.com  
Reason: I am the author of this document  
Location:  
Date: 2023-11-24 09:48+01:00

**Chemical composition (Heat analysis)**

Heat	C [%]	Si [%]	Mn [%]	P [%]	S [%]
569289	max 0,030 0,019	max 1,000 0,400	max 2,000 1,680	max 0,040 0,029	max 0,015 0,009

Heat	Cr [%]	Ni [%]	Mo [%]	N [%]
569289	17,000-18,000 17,210	12,500-14,000 13,220	2,500-3,000 2,640	max 0,100 0,040

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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
569289	2113070-11	0,019	0,410	1,720	0,027	0,006

Heat	Lot	Cr [%]	Ni [%]	Mo [%]	N [%]
		17.000-18.000	12.500-14.000	2.500-3.000	max 0.100
569289	2113070-11	17,290	13,010	2,620	0,041

**Extent of material delivery**

Heat	Lot	Hollow supp.	No. of HTcycles <sup>1)</sup>	Pieces	Total length [m]	Total weight [kg] <sup>2)</sup>
569289	2113069-11	ALLEIMA SE	1	629	3 774.000	845.376
569289	2113070-11	ALLEIMA SE	1	641	3 846.000	861.504
569289	2113071-11	ALLEIMA SE	1	631	3 786.000	848.064
569289	2113072-11	ALLEIMA SE	1	617	3 702.000	829.248
569289	2113073-11	ALLEIMA SE	1	636	3 816.000	854.784
569289	2113074-11	ALLEIMA SE	1	633	3 798.000	850.752
569289	2113075-11	ALLEIMA SE	1	633	3 798.000	850.752
569289	2113077-11	ALLEIMA SE	1	629	3 774.000	845.376

**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 :** 24.11.2023

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

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569289	2113069-11		pass
569289	2113069-11		pass
569289	2113070-11		pass
569289	2113070-11		pass
569289	2113071-11		pass
569289	2113071-11		pass
569289	2113072-11		pass
569289	2113072-11		pass
569289	2113073-11		pass
569289	2113073-11		pass
569289	2113074-11		pass
569289	2113074-11		pass
569289	2113075-11		pass
569289	2113075-11		pass
569289	2113077-11		pass
569289	2113077-11		pass

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

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569289	2113069-11		pass
569289	2113070-11		pass
569289	2113071-11		pass
569289	2113072-11		pass
569289	2113073-11		pass
569289	2113074-11		pass
569289	2113075-11		pass
569289	2113077-11		pass

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

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569289	2113069-11		pass
569289	2113069-11		pass
569289	2113070-11		pass
569289	2113070-11		pass
569289	2113071-11		pass
569289	2113071-11		pass
569289	2113072-11		pass
569289	2113072-11		pass
569289	2113073-11		pass
569289	2113073-11		pass
569289	2113074-11		pass
569289	2113074-11		pass
569289	2113075-11		pass
569289	2113075-11		pass
569289	2113077-11		pass
569289	2113077-11		pass

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

Heat	Lot	ST	Hardness	Hardness ≤22HRC
			[HRB]	[yes/no]
			max 80,000	yes
569289	2113069-11		68,000	yes
569289	2113069-11		70,000	yes
569289	2113070-11		71,000	yes
569289	2113070-11		71,000	yes
569289	2113071-11		70,000	yes
569289	2113071-11		70,000	yes
569289	2113072-11		70,000	yes
569289	2113072-11		72,000	yes
569289	2113073-11		71,000	yes
569289	2113073-11		70,000	yes
569289	2113074-11		70,000	yes
569289	2113074-11		71,000	yes
569289	2113075-11		71,000	yes
569289	2113075-11		70,000	yes
569289	2113077-11		72,000	yes
569289	2113077-11		70,000	yes

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

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569289	2113069-11		pass
569289	2113070-11		pass
569289	2113071-11		pass
569289	2113072-11		pass
569289	2113073-11		pass
569289	2113074-11		pass
569289	2113075-11		pass
569289	2113077-11		pass

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

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569289	2113069-11		pass
569289	2113070-11		pass
569289	2113071-11		pass
569289	2113072-11		pass
569289	2113073-11		pass
569289	2113074-11		pass
569289	2113075-11		pass
569289	2113077-11		pass

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**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
569289	2113069-11		281,500	562,600	53,800	60,000	311,800
569289	2113070-11		283,600	563,200	54,200	62,300	318,100
569289	2113071-11		276,500	558,800	61,400	72,700	306,500
569289	2113072-11		279,900	554,900	55,400	65,300	313,300
569289	2113073-11		291,400	576,300	57,000	65,000	323,900
569289	2113074-11		281,700	560,500	54,200	56,000	311,600
569289	2113075-11		284,200	570,900	59,400	65,700	316,200
569289	2113077-11		281,900	560,900	52,600	55,300	316,600

**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	Grain size
			[No/Yes]	[(G)]
			No	5.000-14.000
569289	2113069-11		No	6,000
569289	2113070-11		No	6,000
569289	2113071-11		No	6,000
569289	2113072-11		No	5,000
569289	2113073-11		No	6,000
569289	2113074-11		No	6,000
569289	2113075-11		No	6,000
569289	2113077-11		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.

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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.