

<b>Type of inspection document :</b> Inspection certificate acc. to EN 10204 / 3.1		A02	<b>Internal order No.:</b> 10080866 - 10	A08
<b>Purchaser :</b> ALLEIMA BENELUX B.V.  AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS		A06	<b>Purchase order No. :</b> 800838  <b>Purchaser's reference :</b> 800838  <b>Project Id. :</b> 4003742	A07
<b>Product :</b> Seamless cold finished tube	B01/B04	<b>Steel designation :</b> 254SMO / 254SMO	B02	
<b>Dimension (OD x WT) :</b> 10,00 x 1,50AW mm	B09/B10	<b>Melting process :</b> AOD	C70	
<b>Technical requirements :</b> ASME SA-213-2023 ASTM A213-2022 ASTM A269-2015a(Reap.2019) EN 10216-5 TC1 - 2021 NORSOK M650/M630,MDS R18, QTR/Type6Mo/INDUKCE/2022 EN 10305-1 (Only Tolerances - Table 5) PED 2014/68/EU ALLEIMA SPEC S-08921 Avesta KFS 993E NACE MR0175-2021/ISO 15156-3:2020, NACE MR0103/ISO 17945-1:2015				B03
<b>Supplementary information :</b> Manufacturing of stainless steel tubes in grade 254 SMO / UNS S31254 / 1.4547 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 [%]
570079	max 0.020 0,010	max 0.700 0,460	max 1.000 0,480	max 0.030 0,023	max 0.010 <0,001

Heat	Cr [%]	Ni [%]	Mo [%]	Cu [%]	N [%]
570079	19.500-20.500 20,230	17.500-18.500 18,070	6.000-6.500 6,080	0.500-1.000 0,570	0.180-0.220 0,206

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Heat	PRE [-] min 40,000
570079	43,5

**Product check analysis**

The PRE number is min. 40 for each individual reading.

PRE = [%Cr] + 3.3 [%Mo] + 16 [%N]

Heat	Lot	C [%] max 0,020	Si [%] max 0,700	Mn [%] max 1,000	P [%] max 0,030	S [%] max 0,010
570079	2137114-11	0,011	0,440	0,490	0,018	0,001

Heat	Lot	Cr [%] 19,500-20,500	Ni [%] 17,500-18,500	Mo [%] 6,000-6,500	Cu [%] 0,500-1,000	N [%] 0,180-0,220
570079	2137114-11	20,150	17,920	6,050	0,570	0,217

**Extent of material delivery**

Heat	Lot	Hollow supp.	No. of HTcycles <sup>1)</sup>	Pieces	Total length [m]	Total weight [kg] <sup>2)</sup>
570079	2137105-11	ALLEIMA SE	1	477	2 862.000	918.702
570079	2137108-11	ALLEIMA SE	1	576	3 456.000	1 109.376
570079	2137114-11	ALLEIMA SE	1	367	2 202.000	706.842

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 : 5.6.2024

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570079	2137105-11		pass
570079	2137105-11		pass
570079	2137108-11		pass
570079	2137108-11		pass
570079	2137114-11		pass
570079	2137114-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570079	2137105-11		pass
570079	2137108-11		pass
570079	2137114-11		pass

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

Heat	Lot	ST	Test result [pass/fail]
			pass
570079	2137105-11		pass
570079	2137105-11		pass
570079	2137108-11		pass
570079	2137108-11		pass
570079	2137114-11		pass
570079	2137114-11		pass

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

Heat	Lot	ST	Hardness [HRB]	Hardness ≤35HRC [yes/no]
			max 90,000	yes
570079	2137105-11		86,000	yes
570079	2137105-11		87,000	yes
570079	2137108-11		87,000	yes
570079	2137108-11		87,000	yes
570079	2137114-11		85,000	yes
570079	2137114-11		84,000	yes

**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 310,000	675,000-850,000	min 35,000	min 35,000	min 340,000
570079	2137105-11		397,400	721,500	53,000	60,000	428,600
570079	2137108-11		393,000	713,700	53,200	57,100	422,400
570079	2137114-11		367,500	710,400	54,000	60,000	394,700

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**Internal order No.:**

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**Microstructure evaluation and Grain size E112/KFS 993E 5.2 ab**

Heat	Lot	ST	Microstructure	Grain size
			[pass/fail]	[(G)]
			pass	3,000-14,000
570079	2137105-11		pass	5,000
570079	2137108-11		pass	5,000
570079	2137114-11		pass	5,000

**Pitting corrosion test (50°C/24hours) in acc. G48A/NORSOK M630 MD**

Heat	Lot	ST	Weight loss	Pitting
			[g/m <sup>2</sup> ]	[No/Yes]
			max 1,000	No
570079	2137105-11		0,000	No
570079	2137108-11		0,000	No
570079	2137114-11		0,000	No

**Dimensional check**

Test results comply with specified criteria.

**HT - Final heat treatment of straight tubes**

Bright annealing at 1200°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.

**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.

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**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.