

Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1	A02	Internal order No.: 10068803 - 100	A08
Purchaser : ALLEIMA BENELUX B.V. . AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS	A06	Purchase order No. : 800788 Purchaser's reference : 800788 Project Id. : 4003516	A07
Product : Seamless cold finished tube Dimension (OD x WT) : 19,05 x 1,24AW mm	B01/B04 B09/B10	Steel designation : 3R60 / 3R60 Melting process : AOD	B02 C70
Technical requirements : ASME SA-213/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
Supplementary information : 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
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 [%]
568924	max 0.030 0,020	max 1.000 0,380	max 2.000 1,590	max 0.040 0,030	max 0.015 0,012

Heat	Cr [%]	Ni [%]	Mo [%]	N [%]
568924	17.000-18.000 17,320	12.500-14.000 13,200	2.500-3.000 2,630	max 0.100 0,042

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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
568924	2109870-11	0,019	0,390	1,630	0,032	0,013

Heat	Lot	Cr [%]	Ni [%]	Mo [%]	N [%]
		17.000-18.000	12.500-14.000	2.500-3.000	max 0.100
568924	2109870-11	17,250	13,080	2,580	0,042

Extent of material delivery

Heat	Lot	Hollow supp.	No. of HTcycles ¹⁾	Pieces	Total length [m]	Total weight [kg] ²⁾
568924	2109870-11	ALLEIMA SE	1	406	2 436.000	1 342.236
568924	2109871-11	ALLEIMA SE	1	203	1 218.000	671.118

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 : 24.10.2023

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Flaring test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
			pass
568924	2109870-11	WnF	pass
568924	2109870-11	EnF	pass
568924	2109871-11	EnF	pass
568924	2109871-11	WnF	pass

ST (sample type): WnF-West end, tube did not not used for flattening test,Enf-East end, tube did not not used for flattening test;

Flaring test in acc. with EN 10216-5

Heat	Lot	Test result [pass/fail]
		pass
568924	2109870-11	pass
568924	2109871-11	pass

Flattening test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
			pass
568924	2109870-11	W	pass
568924	2109870-11	E	pass
568924	2109871-11	E	pass
568924	2109871-11	W	pass

ST (sample type): E-East end of tube; W-West end of tube;

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

Heat	Lot	Hardness [HRB]	Hardness ≤ 22 HRC [yes/no]
		max 80,000	yes
568924	2109870-11	78,000	yes
568924	2109870-11	79,000	yes
568924	2109871-11	79,000	

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

Heat	Lot	Test result [pass/fail]
		pass
568924	2109870-11	pass
568924	2109871-11	pass

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

Heat	Lot	Rp0,2 [MPa]	Rm [MPa]	A2" [%]	Amb.temper. [°C]	A5 [%]
		min 220.000	515.000-690.000	min 35.000	10.000-35.000	min 40.000
568924	2109870-11	303,700	582,300	51,600	24,000	52,400
568924	2109870-11	315,800	589,100	52,000	24,000	54,000
568924	2109871-11	282,500	589,400	51,000	24,000	53,600
568924	2109871-11	309,100	578,900	52,400	24,000	54,700
Heat	Lot	Rp1,0 [MPa]				
		min 250.000				
568924	2109870-11	338,800				
568924	2109870-11	350,300				
568924	2109871-11	320,200				
568924	2109871-11	346,800				

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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.

Straightness check

Test results comply with specified criteria.