

Customer Order #	Item #	Heat #	Art #	Description
	P-7	573184	9141913	22X2,0 HYDR-RÖR 1.4404/1.4435

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Alleima INSPECTION CERTIFICATE

A03/Z02

C-14043/10 Rev. 00

Date : 2025-09-29 Page : 1 / 5

Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1	A02	Internal order No.: 50022623 - 10	A08
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Purchaser : ALLEIMA BENELUX B.V. AMUNDSENWEG 4 . 5928 LT Venlo THE NETHERLANDS	A06	Purchase order No. : Purchaser's reference : Project Id. : 3000866	A07
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Product : Seamless cold finished bright annealed tube	B01/B04	Steel designation : 3R60 / 3R60	B02
Dimension (OD x WT) : 22,00 x 2,00AW mm	B09/B10	Melting process : AOD	C70

Technical requirements : ASME SA-213/SA213M-2023 ASTM A213/A213M-2024 ASTM A269/A269M- 2024 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 MR0103-2015/ISO 17945-1:2015 (R2023) Alleima Spec. S-08921 PED 2014/68/EU	B03
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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 length 6000 mm (-0/+3 mm) Marking template: ALLEIMA 3R60 ASTM/ASME A/SA-213AW A-269 COLD SML EN 10216-5 TC1 CFA TP 316/316L EN 1.4435 NDE 22.00 X 2.00 MM HEAT NO. ... LOT NO.SZ. ... MADE BY ALLEIMA IN CZECHIA *QA-TUBE*	B14
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The products, covered by this certificate, comply with specification and requirements of the order.	Z01
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Originator of the document : QA - AC	A05/Z02	Inspector's stamp:	Z03
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Chemical composition (Heat analysis)

Heat	C [%]	Si [%]	Mn [%]	P [%]	S [%]
P-7 573184	max 0,030 0,018	max 1,000 0,400	max 2,000 1,630	max 0,040 0,029	max 0,015 0,009
Heat	Cr [%]	Ni [%]	Mo [%]	N [%]	Co [%]
573184	17,000-18,000 17,260	12,500-14,000 13,070	2,500-3,000 2,610	max 0,100 0,034	info 0,100

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Heat	Ti [%] info	Al [%] info
573184	<0,003	0,004

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
573184	2197184-11	0,020	0,410	1,660	0,026	0,007

Heat	Lot	Cr [%] 17.000-18.000	Ni [%] 12.500-14.000	Mo [%] 2.500-3.000	N [%] max 0.100
573184	2197184-11	17,130	13,320	2,590	0,028

Extent of material delivery

Heat	Lot	Hollow supp.	No. of HTcycles ¹⁾	Pieces	Total length [m]	Total weight [kg] ²⁾
573184	2197184-11	ALLEIMA SE	1	264	1 584.000	1 580.832

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 : 29.09.2025

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Flaring test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
			pass
573184	2197184-11	EnF	pass
573184	2197184-11	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
573184	2197184-11	pass

Flattening test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
			pass
573184	2197184-11	E	pass
573184	2197184-11	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
573184	2197184-11	74,000	yes
573184	2197184-11	77,000	yes

Intergranular corrosion testing in acc. with ASTM A262E

Heat	Lot	Test result [pass/fail]
		pass
573184	2197184-11	pass

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

Heat	Lot	Test result [pass/fail]
		pass
573184	2197184-11	pass

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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
573184	2197184-11	265,500	579,300	55,000	24,000	49,800
573184	2197184-11	266,000	579,400	55,600	24,000	50,300

Heat	Lot	Rp1,0 [MPa]
		min 250,000
573184	2197184-11	297,800
573184	2197184-11	299,000

Microstructure evaluation and Grain size S-08921/ASTM E112

The structure is free from grain boundary chromium carbide precipitations.

Heat	Lot	G.B.Cr.Carbides [No/Yes]	Grain size [(G)]
		No	5,000-14,000
573184	2197184-11	No	6,000

Dimensional check

Test results comply with specified criteria.

HT - Final heat treatment of straight tubes

All tubes have been bright annealed followed by accelerated cooling.
Solution annealing temperature 1090°C, soaking time min. 2 minutes.
Quench medium - protective 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.

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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.