

Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1	A02	Internal order No.: 10078907 - 40	A08
Purchaser : ALLEIMA BENELUX B.V. . AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS	A06	Purchase order No. : 800834 Purchaser's reference : 800834 Project Id. : 4003726	A07
Product : Seamless cold finished tube	B01/B04	Steel designation : 3R60 / 3R60	B02
Dimension (OD x WT) : 12,00 x 1,50AW mm	B09/B10	Melting process : AOD	C70
Technical requirements : 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
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 [%]
	max 0.030	max 1.000	max 2.000	max 0.040	max 0.015
569958	0,022	0,390	1,640	0,030	0,007
569961	0,020	0,390	1,580	0,028	0,008

Heat	Cr [%]	Ni [%]	Mo [%]	N [%]	Co [%]
	17.000-18.000	12.500-14.000	2.500-3.000	max 0.100	info
569958	17,210	13,130	2,650	0,045	0,120
569961	17,570	13,200	2,630	0,038	0,120

Type of inspection document :

A02

Internal order No.:

A08

Inspection certificate acc. to EN 10204 / 3.1

10078907 - 40

Heat	Ti [%] info
569958	<0,003
569961	<0,003

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
569958	2125652-11	0,022	0,380	1,660	0,027	0,008
569961	2125649-11	0,019	0,390	1,630	0,029	0,008

Heat	Lot	Cr [%] 17.000-18.000	Ni [%] 12.500-14.000	Mo [%] 2.500-3.000	N [%] max 0.100
569958	2125652-11	17,300	12,970	2,540	0,044
569961	2125649-11	17,480	12,980	2,570	0,047

Extent of material delivery

Heat	Lot	Hollow supp.	No. of HTcycles ¹⁾	Pieces	Total length [m]	Total weight [kg] ²⁾
569958	2125650-11	ALLEIMA SE	1	487	2 922.000	1 148.346
569958	2125651-11	ALLEIMA SE	1	494	2 964.000	1 164.852
569958	2125652-11	ALLEIMA SE	1	473	2 838.000	1 115.334
569958	2125653-11	ALLEIMA SE	1	486	2 916.000	1 145.988
569958	2125654-11	ALLEIMA SE	1	491	2 946.000	1 157.778
569958	2125655-11	ALLEIMA SE	1	425	2 550.000	1 002.150
569961	2125649-11	ALLEIMA SE	1	270	1 620.000	636.660

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 : 19.3.2024

Type of inspection document :

A02

Internal order No.:

A08

Inspection certificate acc. to EN 10204 / 3.1

10078907 - 40

Flaring test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
pass			
569958	2125650-11		pass
569958	2125650-11		pass
569958	2125651-11		pass
569958	2125651-11		pass
569958	2125652-11		pass
569958	2125652-11		pass
569958	2125653-11		pass
569958	2125653-11		pass
569958	2125654-11		pass
569958	2125654-11		pass
569958	2125655-11		pass
569958	2125655-11		pass
569961	2125649-11		pass
569961	2125649-11		pass

Flaring test in acc. with EN 10216-5

Heat	Lot	ST	Test result [pass/fail]
pass			
569958	2125650-11		pass
569958	2125651-11		pass
569958	2125652-11		pass
569958	2125653-11		pass
569958	2125654-11		pass
569958	2125655-11		pass
569961	2125649-11		pass

Flattening test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
pass			
569958	2125650-11		pass
569958	2125650-11		pass
569958	2125651-11		pass
569958	2125651-11		pass
569958	2125652-11		pass
569958	2125652-11		pass
569958	2125653-11		pass
569958	2125653-11		pass
569958	2125654-11		pass
569958	2125654-11		pass
569958	2125655-11		pass
569958	2125655-11		pass
569961	2125649-11		pass
569961	2125649-11		pass

Type of inspection document :

A02

Internal order No.:

A08

Inspection certificate acc. to EN 10204 / 3.1

10078907 - 40

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

Heat	Lot	ST	Hardness	Hardness ≤22HRC
			[HRB]	[yes/no]
			max 80,000	yes
569958	2125650-11		78,000	yes
569958	2125650-11		78,000	yes
569958	2125651-11		77,000	yes
569958	2125651-11		78,000	yes
569958	2125652-11		78,000	yes
569958	2125652-11		77,000	yes
569958	2125653-11		77,000	yes
569958	2125653-11		77,000	yes
569958	2125654-11		77,000	yes
569958	2125654-11		76,000	yes
569958	2125655-11		76,000	yes
569958	2125655-11		76,000	yes
569961	2125649-11		76,000	yes
569961	2125649-11		79,000	yes

Intergranular corrosion testing in acc. with ASTM A262E

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569958	2125650-11		pass
569958	2125651-11		pass
569958	2125652-11		pass
569958	2125653-11		pass
569958	2125654-11		pass
569958	2125655-11		pass
569961	2125649-11		pass

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

Heat	Lot	ST	Test result
			[pass/fail]
			pass
569958	2125650-11		pass
569958	2125651-11		pass
569958	2125652-11		pass
569958	2125653-11		pass
569958	2125654-11		pass
569958	2125655-11		pass
569961	2125649-11		pass

Type of inspection document :

A02

Internal order No.:

A08

Inspection certificate acc. to EN 10204 / 3.1

10078907 - 40

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
569958	2125650-11		298,700	584,300	58,100	59,300	324,900
569958	2125651-11		294,000	589,700	59,800	68,200	321,800
569958	2125652-11		296,500	588,900	60,700	61,900	324,900
569958	2125653-11		290,500	579,800	58,600	61,000	318,100
569958	2125654-11		290,300	573,900	59,200	67,800	319,200
569958	2125655-11		287,600	577,100	57,700	61,200	319,600
569961	2125649-11		297,500	595,100	59,400	66,100	326,000

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
569958	2125650-11		No	7,000
569958	2125651-11		No	6,000
569958	2125652-11		No	7,000
569958	2125653-11		No	6,000
569958	2125654-11		No	6,000
569958	2125655-11		No	6,000
569961	2125649-11		No	7,000

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.

Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1	A02	Internal order No.: 10078907 - 40	A08
---	-----	---	-----

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.