

Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1	A02	Internal order No.: 10073302 - 70	A08
Purchaser : ALLEIMA BENELUX B.V. AMUNDSENWEG 4 5928 LT VENLO THE NETHERLANDS	A06	Purchase order No. : 800805 Purchaser's reference : 800805 Project Id. : 4003609	A07
Product : Seamless cold finished tube	B01/B04	Steel designation : 3R60 / 3R60	B02
Dimension (OD x WT) : 25,40 x 1,24AW mm	B09/B10	Melting process : AOD	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 length 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 [%]
569648	max 0.030 0,019	max 1.000 0,390	max 2.000 1,630	max 0.040 0,027	max 0.015 0,006

Heat	Cr [%]	Ni [%]	Mo [%]	N [%]	Co [%]
569648	17.000-18.000 17,190	12.500-14.000 13,110	2.500-3.000 2,630	max 0.100 0,036	info 0,120

Type of inspection document : Inspection certificate acc. to EN 10204 / 3.1	A02	Internal order No.: 10073302 - 70	A08
---	-----	---	-----

Heat	Ti [%] info
569648	0,009

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
569648	2122073-11	0,018	0,410	1,670	0,031	0,007

Heat	Lot	Cr [%] 17.000-18.000	Ni [%] 12.500-14.000	Mo [%] 2.500-3.000	N [%] max 0.100
569648	2122073-11	17,140	13,060	2,640	0,042

Extent of material delivery

Heat	Lot	Hollow supp.	No. of HTcycles ¹⁾	Pieces	Total length [m]	Total weight [kg] ²⁾
569648	2122073-11	ALLEIMA SE	1	221	1 326.000	990.522

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 : 4.3.2024

Type of inspection document :

A02

Internal order No.:

A08

Inspection certificate acc. to EN 10204 / 3.1

10073302 - 70

Flaring test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
			pass
569648	2122073-11	WnF	pass
569648	2122073-11	EnF	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
569648	2122073-11	pass

Flattening test in acc. with ASTM A 1016

Heat	Lot	ST	Test result [pass/fail]
			pass
569648	2122073-11	W	pass
569648	2122073-11	E	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 \leq 22HRC [yes/no]
		max 80,000	yes
569648	2122073-11	73,000	yes
569648	2122073-11	75,000	yes

Intergranular corrosion testing in acc. with ASTM A262E

Heat	Lot	Test result [pass/fail]
		pass
569648	2122073-11	pass

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

Heat	Lot	Test result [pass/fail]
		pass
569648	2122073-11	pass

Type of inspection document :

A02

Inspection certificate acc. to EN 10204 / 3.1

Internal order No.:

A08

10073302 - 70

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
569648	2122073-11	303,300	583,100	52,000	24,000	51,100
569648	2122073-11	309,600	596,600	52,800	24,000	49,800

Heat	Lot	Rp1,0 [MPa]
		min 250,000
569648	2122073-11	337,300
569648	2122073-11	344,400

Microstructure evaluation and Grain size WI-3815/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
569648	2122073-11	No	7,000

Dimensional check

Test results comply with specified criteria.

HT - Final heat treatment of straight tubes

All tubes have been solution 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. 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.:

10073302 - 70

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.