

**Inspection certificate
Certificate of Conformance**

0002069315



acc. to DIN EN 10204-3.1

Customer:

ALLEIMA BENELUX B.V.

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Your Order information	Heat	MO - No.	CO - No.
24.07.2022 800734 01 Kathrin Stross	564141	0002069315	0010046921

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Nominal Dimension & Tolerances				
OD	+ 0.080 mm + 0.003 inch	12.700 mm 0.500 inch	- 0.080 mm - 0.003 inch	
ID		10.220 mm 0.402 inch		
WT	+ 10.00 %	1.240 mm 0.049 inch	- 10.00 %	

Single length	6000,00 mm	+ 5.00 mm	- 0.00 mm
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Material Requirements	2RK65 / 1.4539 / UNS N08904 7-2-1261 Rev. 25, ASTM A213/A213M-23, ASTM A269/A269M-22, DIN EN 10216-5:2021-06, ASME SA-213/SA-213M (23)
Finish	bright annealed

Marking	Alleima 2RK65 ASTM/ASME A/SA-213AW A-269 COLD SML UNS N08904 EN 10216-5 CFA TC1 NDE EN 1.4539 12.7 mm OD x 1.24 mm WT 1/2" OD x 0.049" WT HT 564141 LOT 0002069315 Made by Alleima in Germany *QA TUBE*
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Quantity	PCS	M / FT	KG / LBS
	260	1560.000	5118.110
		577.000	1272.054

0002069315

Chemical composition

Heat No. 564141																
	C	Si	Mn	P	S	N	Cr	Cu	Mo	Nb	Ni	Ti	Pren-value			
Heat	0.014	0.41	1.66	0.020	<0.0005	0.065	20.33	1.35	4.15		24.82		35.1 %			
Product	0.016	0.42	1.66	0.019	<0.001	0.069	20.30	1.35	4.15		24.78					
	Ta	Nb+Ta	W	Co	V	Al	O	Fe	B	Ca	Mg	Pb	Ce	As	Sb	Sn
Heat																
Product																
Inclusion content	A:		B:		C:		D:		EB		ED					
	th		th		th		th		th		th					
	h		h		h		h		h		h					

Mechanical tests

	0,2% -		1% -		Tensile Strength		Elongation		Elongation at max.	Reduct	Hardness
	Yield Strength		Yield Strength		MPa / KSI		%		force	of Area	
	MPa / KSI	MPa / KSI	MPa / KSI	MPa / KSI	MPa / KSI	A% min. 35, A2"% min. 35	Ag %	Z%	HRB max. 80 / HRC max. 22		
1	270	39.158	318	46.120	620	89.920	44.2	37,9			76/<20
2	271	39.303	320	46.410	634	91.950	42.8	42,6			79/<20
3	270	39.158	319	46.265	614	89.050	44.4	36,8			
4	276	40.029	324	46.990	618	89.630	46.5	37,1			
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Tensile test at elevated / low temperature

	temperature °C	0,2% - Yield Strength		1% - Yield Strength		Tensile Strength		Elongation %
		MPa	/ KSI	MPa	/ KSI	MPa	/ KSI	
1								
2								
1								
2								
1								
2								
1								
2								

Impact test

	temperature °C	Impact energy KV J	Average J	Lateral expansion mm	Average mm
2					
3					
4					
5					
6					

Surface roughness

	Roughness outside OD Ra max. 1 µm				Roughness inside ID aim for Ra max. 1 µm			
	axial		radial		axial		radial	
	min	max	min	max	min	max	min	max
µm								
Ra	0.26	0.43			0.08	0.13		
Rq	0.38	0.62			0.10	0.19		
Rz	2.99	4.85			0.61	1.46		
Rt	4.12	8.10			0.76	4.13		
Rmax	3.44	7.43			0.76	4.13		
%								
tpa								
µin								
RMS	14.96	24.41			3.94	7.48		
CLA	10.24	16.93			3.15	5.12		

Corrosion tests

ASTM G48	Method A @25°C/24h; no pitting at 20X magnification; weight loss max. 4.0g/m ²
Weight loss	Visual test 20X magnification
< 0.18g/m ²	satisfactory
ASTM G28	
Corrosion rate	

Grain size

Requirement	Result
ASTM E112-13, 5 or finer (5-14) / longitudinal direction	5

Surface imperfections

Test position	Requirement	Result
ID		
OD		

Following tests were performed satisfactory:

	Tests	Requirements
1	yield strength Rp 0,2	Dehngrenze Rp 0,2 min. 230 MPa
2	yield strength Rp 1,0	Dehngrenze Rp 1,0 min. 250 MPa
3	tensile strength Rm	Zugfestigkeit Rm 520 - 700 MPa
4	elongation	Dehnung A% min. 35, A2"% min. 35
5	tensile test standard	Zugversuch Prüfnorm ASTM A370-22 / ASTM E8/E8M-22
6	hardness	Härte HRB max. 80 / HRC max. 22
7	hardness standard	Härte Prüfnorm ASTM E18-22
8	flaring test	Aufweit ASTM A1016/A1016M-18a pt. 22
9	flattening test	Ringfalt ASTM A1016/A1016M-18a pt. 19/ EN ISO 8492:2013
10	roughness OD	Rauhtiefe AD Ra max. 1 µm
11	roughness ID	Rauhtiefe ID aim for Ra max. 1 µm
12	corrosion test	Korrosionsprüfung ASTM G48 Method A @25°C/24h; no pitting at 20X magnification; weight loss max. 4,0g/m ²
13	corrosion test	Korrosionsprüfung ASTM A262 Practice E
14	corrosion test	Korrosionsprüfung DIN EN ISO 3651-2C
15	grain size	Korngröße ASTM E112-13, 5 or finer (5-14) / longitudinal direction
16	structure	Gefüge no carburization/ no intergran. carbide precip. ASTM A1016/A1016M-18a §25.8.2.1/ASTM E426-16/ DIN EN ISO 10893-1:2020-10
17	eddy current test	Wirbelstromprüfung QW 10-0101 Eddy Current Testing
18	procedure: eddy current test	Arbeitsanweisung: WS-Prüfung
19	ovality	Ovalität max. 0,005" (max. 0,127 mm)
20	straightness	Geradheit max. 1,5 mm/m
21	PREN	Pren min. 34
22	inspection certificate	Zeugnis Art 3.1
23	Source of raw material	Ursprung Alleima AB Sweden
24	Dimension and visual inspection	Maß- und Sichtprüfung Without complaint
25	Melting process	Erschmelzungsart The steel/material is AOD refined
26	Production	Produktion Tubes are made in Germany
27	Alloy verification	Materialverwechslungsprüfung 100 % PMI
28	Heat treatment	Wärmebehandlung at 1120°C ~ 10 minutes
29	cooling medium	Abkühlmedium hydrogen atmosphere / heat exchanger / jet- fan
30	Weld repairs	Schweißreparaturen have not been performed
31	Radioactivity	Radioaktivität Tubes have no radioactive contamination
32	Mercury	Quecksilber has not come in contact with mercury
33	Contact	Kontakt has not come in c. with low melting point elements
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The delivered products comply with the requirements of the order.

2023-11-02

Jonas Gührs

Quality assurance inspector

This certificate is produced electronically and is valid without signature.