



CertificateNo

1(5)

Date

2021-05-27

Customer Reference

Customer Address

BOX 2088
PROCESSKONTROLL ITEMS AB
PROCESSKONTROLL ITEMS AB
444 02 STORA HÖGA
SWEDEN

Customer Article No.

THT-C-3R60-12-1

Order Number

761174

Sandvik Reference

Catalogue Code

THT-C-3R60-12-1

Lot

002014230

Heat

558037

Delivered Quantity

110.2 Metres

Customer Order No.

171483

Customer Order Line

1

Pack Note No.

193466



Sandvik High Precision Tube

V 1.3 - 20200504

Inspection certificate Certificate of Conformance

0002014230



acc. to DIN EN 10204-3.1

Customer:

AB SANDVIK MATERIALS TECHNOLOGY

Approvals Sandvik High Precision Tube France:

EN 9100 - ISO 9001 - OHSAS 18001 - ISO 14001 - 2014/68/EU

Approvals Sandvik High Precision Tube Germany:EN 9100 - ISO 9001 - IATF 16949 - OHSAS 18001 - ISO 14001 - DIN EN ISO 50001 - ISO/IEC 17025 - AD 2000 - 2014/68/EU
Norsok M-650 (25 Cr Duplex SS - 6Mo Tubes - Austenitic stainless steel, Type 6Mo)

Your Order information	Heat	MO - No.	CO - No.
26.05.2020 800693-2 Kathrin Stross	558037	0002014230	0010008357

Product	Seamless stainless SANDVIK HPT Steel Tubes
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Nominal Dimension & Tolerances	Results dimensional test			
	min.		max.	
OD	+ 0.100 mm + 0.004 inch	12.000 mm 0.472 inch	- 0.100 mm - 0.004 inch	12,03 12,06
ID		10.000 mm 0.394 inch		
WT	+ 10.00 %	1.000 mm 0.039 inch	- 10.00 %	1,0 1,04

Single length	100000,0 - 150000,0 mm
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Material Requirements	1.4435/TP316L/3R60 ASTM A213/A213M-19, ASTM A269-15a, DIN EN 10216-5 03/14 TC1 , NACE MR0175/ISO 15156-3:2015
Finish	CFA, bright annealed

Marking	SANDVIK 3R60 WNR 1.4435/TP316L EN 10216-5 TC1 ASTM A213 AW/A269 CF M S TC1 12,00x1,00 mm Heat 558037 Lot 0002014230 Made by Sandvik in Germany *QA-Tube*
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Quantity	PCS	M / FT	KG / LBS
	18	2302.765 7555.00	646.511 1425.30

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Chemical composition

Heat No.		558037														
	C	Si	Mn	P	S	N	Cr	Ca	Mo	Nb	Ni	Ti	Pren-value			
Heat	0.023	0.39	1.68	0.034	0.008	0.039	17.40		2.63		13.09					26.51 %
Product	0.018	0.39	1.66	0.031	0.008	0.041	17.37		2.57		13.07					
	Ta	Nb+Ta	W	Co	V	Al	O	Fe	B	Cu	Mg	Pb	Ce	As	Sn	Sr
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		Reduct	Hardness
	Yield Strength	Yield Strength	Yield Strength	Yield Strength	MPa / KSI	MPa / KSI	%	max. force	of Area			
	MPa / KSI	MPa / KSI	MPa / KSI	MPa / KSI	490 - 690 MPa		A% min. 40/ A2"% min. 35		Ag %	Z%		HRB max. 90/ HRC max. 22
1	239 34.662	277 40.174	542 78.607	51.3 46,3								73/<20
2	233 33.792	276 40.029	544 78.897	52.0 46,9								73/<20
3												74/<20
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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				Roughness inside ID			
	axial		radial		axial		radial	
	min	max	min	max	min	max	min	max
µm								
Ra								
Rq								
Rz								
Rt								
Rmax								
%								
tpa								
µin								
RMS								
CLA								

Corrosion tests

ASTM G48	
Weight loss	Visual test 20X magnification
ASTM G28	
Corrosion rate	

Grain size

Requirement	Result

Surface imperfections

Test position	Requirement	Result
ID		
OD		

0002014230

Following tests were performed satisfactory:

	Tests	Requirements
1	yield strength Rp 0,2	Dehngrenze Rp 0,2 min. 190 MPa
2	yield strength Rp 1,0	Dehngrenze Rp 1,0 min. 225 MPa
3	tensile strength Rm	Zugfestigkeit Rm 490 - 690 MPa
4	elongation	Dehnung A% min. 40/ A2% min. 35
5	hardness	Härte HRB max. 90/ HRC max. 22
6	flaring test	Aufweit ASTM A1016 pt. 22
7	flattening test	Ringfalt ASTM A1016 pt. 19/ EN ISO 8492
8	eddy current test	Wirbelstromprüfung ASTM A1016/ ASTM E426/ EN ISO 10893-1 Tab. 2
9	procedure: eddy current test	Arbeitsanweisung: WS-Prüfung QW 10-0101 Eddy Current Testing
10	inspection certificate	Zeugnis Art 3.1
11	Source of raw material	Ursprung Sweden
12	Dimension and visual inspection	Maß- und Sichtprüfung Without complaint
13	Melting process	Erschmelzungsart The steel is AOD refined
14	Production	Produktion Tubes are made in Germany
15	Alloy verification	Materialverwechslungsprüfung 100 % PMI
16	Heat treatment	Wärmebehandlung vacuum atmosphere
17	Weld repairs	Schweißreparaturen have not been performed
18	Radioactivity	Radioaktivität Tubes have no radioactive contamination
19	Mercury	Quecksilber has not come in contact with mercury
20	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.

2021-02-01

Jonas Gührs (DE and FR) / Chris Lamonde (US)

Quality assurance inspector

This certificate is produced electronically and is valid without signature.