

**Date**

2021-09-30

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

Philip coil 12-1

Sandvik Reference**Catalogue Code**

THT-C-3R60-12-1

Lot

002023805

Heat

559611

Delivered Quantity

150.41 Metres

Customer Order No.

171980

Customer Order Line

1

Pack Note No.

194267



Sandvik High Precision Tube

V 1.3 - 20210601

Inspection certificate Certificate of Conformance

0002023805



acc. to DIN EN 10204-3.1

Customer:

AB SANDVIK MATERIALS TECHNOLOGY

Approvals Sandvik High Precision Tube Germany:

EN 9100 - ISO 9001 - IATF 16949 - ISO 45001 - 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.
05.05.2021 800700-2 Kathrin Stross	559611	0002023805	0010012599

Product	Seamless stainless SANDVIK HPT Steel Tubes
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Nominal Dimension & Tolerances				Results dimensional test	
				min.	max.
OD	+ 0.100 mm	12.000 mm	- 0.100 mm	11,96	12,04
	+ 0.004 inch	0.472 inch	- 0.004 inch		
ID		10.000 mm			
		0.394 inch			
WT	+ 10.00 %	1.000 mm	- 10.00 %	0,96	1,02
		0.039 inch			

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 559611 Lot 0002023805 Made by Sandvik In Germany *QA-Tube*
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Quantity	PCS	M/FT	KG/LBS
	14	2068,121	6785,174
			569,000
			1254,417

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Chemical composition

Heat No. 558611																
	C	Si	Mn	P	S	N	Cr	Cu	Mo	Nb	Ni	Ti	Prevalable			
Heat	0.019	0.42	1.64	0.033	0.008	0.041	17.43				13.10		26.68 %			
Product	0.018	0.42	1.64	0.033	0.008	0.043	17.38		2.61		13.07					
	Te	Nb+Ta	W	Co	V	Al	O	Fa	B	Ca	Mg	Pb	Cd	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% - Yield Strength MPa / KSI		1% - Yield Strength MPa / KSI		Tensile Strength MPa / KSI		Elongation %		Elongation at max. force	Reduct of Area	Hardness
	min. 190 MPa		min. 225 MPa		490 - 690 MPa		A% min. 40, A2"% min. 35		Ag %	Z%	HRB max. 90, HRC max. 22
1	229	33.212	284	38.288	518	75.126	48.1	47.8			68/ <20
2	241	34.952	278	40.319	521	75.562	46.6	46.2			69/ <20
3	243	35.242	277	40.174	520	75.416	46.6	46.5			68/ <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
1					
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		

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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	EN ISO 10893-1 Tab. 2/ ASTM A1016/ ASTM E426
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.

2021-08-18

Jonas Gührs

Quality assurance inspector

This certificate is produced electronically and is valid without signature.