



PHILIP CORNES

TEST CERTIFICATE



02

Soil Machine Dynamics Limited
Turbinia Works
Davy Bank
Wallsend
44
NE28 6UZ

ATTN:

26/10/07

CUST PO: 046469

ORDER NO: 30163414

0001

ASTM A269
Stainless Steel - TP316/316L
Imperial Seamless Tube
1/2"OD x .064" Wall
12.70mm OD x 1.63mm Wall

QTY: 10.390 UNIT: M
LENGTH: RANDOM

MATERIAL PO#: 30519617 0001
HEAT NO: 513094.55666
CUST PART NO:

PRIORITY DOCUMENT



CERTIFICATE

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INSPECTION CERTIFICATE acc to
EN 10 204 3.1

TW METALS LTD
MAJESTIC RD, NURSLING ESTATE
NURSLING
SOUTHAMPTON SO16 0AF
ENGLAND

INSPECTION STAMP
QA-TUBE

Customer References

M30519617

Customer
order
2007-06-15

180-04357 T W METALS

Sandvik References

Order No. Subs No. ABSMT Dispatch note
06123/54

ABSMT No. C.Code
300-49820 15

Material description

SEAMLESS STAINLESS COLD FINISHED
HYDRAULIC TUBING

Steel/material Designations

Sandvik AISI
3R60 TP316/TP316L

Steel making process
Electric furnace

Technical requirements

ASTM A-213-05C AW, ASTM A-269-04
NACE MR0175/ISO 15156-3:2003
HRB MAX 80.

EXTENT OF DELIVERY

It	Product designation	Heat	Lot	Pieces	Kg	M
01	THT-3R60-12.7-1.65S	511215	47995	3	8.0	17.00
	12.70 X 1.65	513018	54522	16	38.0	86.00
		513741	55364	23	58.0	131.00
		513741	55365	32	83.0	186.00
		513094	55539	34	84.0	189.00
		513094	55664	28	69.0	154.00
		513094	55666	22	52.0	116.00
		513915	56018	30	74.0	165.00
		513915	56019	29	72.0	162.00
		513740	56020	26	65.0	146.00
		513740	56026	42	106.0	237.00
		513740	56028	22	56.0	126.00
		513740	56243	66	170.0	381.00
		513740	56345	41	102.0	229.00
		513915	56960	44	110.0	246.00
		513915	56961	51	131.0	293.00
		514028	57273	25	62.0	140.00
		Total	534	1340.0	3004.00	

Quality assurance - Per Eriksson/ QA-manager Tube & Pipe
MTC Service / Certificates

AB SANDVIK MATERIALS TECHNOLOGY Reg No. 556234-6832 VAT No. SE663000-060901
SE-81181 SANDVIKEN SWEDEN www.smt.sandvik.com mtc_service.smt@sandvik.com

30519617-1

TEST RESULTS**Chemical composition (weight%)**

Heat	C	Si	Mn	P	S	Cr	Ni	Mo
511215	0.017	0.37	1.60	0.027	0.009	17.35	13.18	2.53
513018	0.020	0.35	1.60	0.032	0.0047	17.26	13.32	2.61
513094	0.017	0.42	1.65	0.037	0.010	17.47	13.35	2.60
513740	0.017	0.430	1.54	0.029	0.009	17.30	13.15	2.55
513741	0.019	0.400	1.63	0.030	0.011	17.36	13.13	2.55
513915	0.017	0.41	1.59	0.028	0.007	17.29	13.10	2.52
514028	0.020	0.41	1.58	0.029	0.007	17.31	13.19	2.52
	Co	N						
511215	0.10	0.034						
513018	0.12	0.035						
513094	0.093	0.041						
513740	0.100	0.040						
513741	0.100	0.040						
513915	0.11	0.039						
514028	0.097	0.032						

Chemical composition, product (weight%)

Heat	C	Si	Mn	P	S	Cr	Ni	Mo
511215	0.017	0.38	1.64	0.028	0.006	17.38	13.17	2.54
513018	0.019	0.36	1.59	0.032	0.005	17.37	13.34	2.61
513094	0.015	0.42	1.62	0.034	0.010	17.43	13.29	2.56
513740	0.016	0.43	1.53	0.028	0.006	17.29	13.13	2.55
513741	0.017	0.40	1.61	0.028	0.008	17.31	13.05	2.53
513915	0.017	0.41	1.59	0.027	0.006	17.36	13.16	2.55
514028	0.021	0.42	1.57	0.028	0.006	17.39	13.23	2.52
	Co	N						
511215	0.12	0.032						
513018	0.12	0.036						
513094	0.093	0.042						
513740	0.11	0.041						
513741	0.10	0.042						
513915	0.11	0.042						
514028	0.10	0.033						



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Tensile test at room temperature

Lot	Yield strength	Tensile strength	Elongation
	MPa Rp0.2	MPa Rm	% 2"
47995	268	580	48
	261	581	46
54522	256	585	46
	257	586	44
55364	269	588	44
	269	589	46
55365	297	596	43
	294	597	44
55539	287	581	45
	287	580	44
55664	290	592	50
	290	592	48
55666	292	592	49
	276	572	51
56018	279	573	51
	276	572	50
56019	291	608	45
	290	608	44
56020	292	608	46
	278	590	47
56026	275	590	45
	276	591	46
56028	300	608	43
	299	608	44
56243	299	608	45
	294	607	46
56245	298	610	45
	300	609	48
56345	289	610	44
	294	610	44
56960	294	610	45
	294	599	41
56961	289	594	41
	287	598	42
57273	285	584	41
	288	584	46
57273	275	582	45
	283	608	42
57273	282	608	42
	284	608	42
57273	293	600	43
	286	599	44
57273	283	599	46
	251	591	43
57273	248	591	44

Hardness test

Lot	Min HRB	Max HRB
47995	70.0	73.0
54522	72.0	73.0
55364	71.0	72.0
55365	74.0	75.0
55539	74.0	76.0
55664	72.0	75.0
55666	73.0	78.0
56018	75.0	78.0
56019	77.0	79.0
56020	72.0	75.0
56026	77.0	79.0
56028	78.0	80.0
56243	77.0	79.0
56345	72.0	73.0
56960	73.0	77.0
56961	78.0	79.0
57273	72.0	74.0

Following controls/tests have been satisfactorily performed:

- Flattening test
- Flaring test
- PMI-test.
- Leak test: Eddy current test acc to ASTM A-450.
- Visual inspection and dimensional control.

Heat Treatment:

Solution annealed and quenched.

The number of tests are based on the size of the manufacturing lot before cutting to finished lengths.

The delivered products comply with the specifications and requirements of the order.

The material is manufactured according to a Quality system, approved and registered to ISO 9001.

The certificate is produced with EDP and valid without signature.