



INSPECTION CERTIFICATE acc to
EN 10 204 3.1

Processkontroll Items AB
Box 2088
444 02 STORA HÖGA
SWEDEN

INSPECTION STAMP
QA-TUBE

Customer References

713611

Sandvik References

| | | |
|-----------|----------|---------------|
| Order No. | Subs No. | Dispatch note |
| 355732 | 131857 | 136658 |
| Suppl. No | C.Code | |
| 131857 | 15 | |

Material description

SEAMLESS STAINLESS COLD FINISHED
HYDRAULIC TUBING

Steel/material Designations

| | |
|---------|--------------|
| Sandvik | AISI |
| 3R60 | TP316/TP316L |
| EN no | |
| 1.4435 | |

Steel making process

Electric furnace

Technical requirements

ASTM A-213-11A AW, ASME SA-213-ED-10 AD-11A AW, ASTM A-269-10
NACE MR0175/ISO 15156-3:2009
PED 97/23/EC EN 10216-5 TC1
HRB MAX 80

EXTENT OF DELIVERY

| It | Product designation | Heat | Lot | Kg | M |
|----|---------------------|--------|-------|-------|---------|
| 02 | THT-3R60-12-1 | 537094 | 20836 | 118.9 | 432.00 |
| | 12.00 X 1.00 | 537094 | 20837 | 82.6 | 300.00 |
| | | 537094 | 20838 | 74.3 | 270.00 |
| | | | Total | 275.9 | 1002.00 |

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

| Heat | C | Si | Mn | P | S | Cr | Ni | Mo |
|--------|-------|------|------|-------|-------|-------|-------|------|
| 537094 | 0.017 | 0.38 | 1.67 | 0.031 | 0.009 | 17.51 | 13.15 | 2.52 |
| | N | | | | | | | |
| 537094 | 0.034 | | | | | | | |

Chemical composition, product (weight%)

| Heat | C | Si | Mn | P | S | Cr | Ni | Mo |
|--------|-------|------|------|-------|-------|-------|-------|------|
| 537094 | 0.018 | 0.39 | 1.67 | 0.030 | 0.008 | 17.40 | 13.02 | 2.54 |
| | N | | | | | | | |
| 537094 | 0.039 | | | | | | | |

Quality assurance - Sofia Åkesson / QA-manager
MTC Service / Certificates

**Tensile test at room temperature**

| Lot | Yield strength | | Tensile strength | Elongation | |
|-------|----------------|-------|------------------|------------|----|
| | MPa | MPa | MPa | % | % |
| | Rp0.2 | Rp1.0 | Rm | A | 2" |
| 20836 | 306 | 348 | 569 | 48 | 45 |
| 20837 | 310 | 354 | 575 | 57 | 51 |
| 20838 | 298 | 342 | 563 | 49 | 46 |

Hardness test

| Lot | Min | Max |
|-------|-----|-----|
| | HRB | HRB |
| 20836 | 73 | 75 |
| 20837 | 74 | 75 |
| 20838 | 73 | 75 |

Following controls/tests have been satisfactorily performed:

- Flattening test.
- Flaring test
- PMI-test.
- Intergranular corrosion test acc to ASTM A-262 PR.E
- Leak test: Eddy current test acc to EN 10246-2, ASME SA-1016.
- Visual inspection and dimensional control.

Heat Treatment:

Solution annealed at a temperature of Min 1040° C and quenched.

Marking:

SANDVIK 3R60 ASTM/ASME A/SA-213AW A-269 EN 10216-5 TC1 EN 10305-1 EN 1.4435 TP 316/316L COLD SMLS NDE 12.00 X 1.00 MM HT 537094 SS LOT 20836 MADE BY SANDVIK IN SWEDEN *QA-TUBE*

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The raw material is free from radioactive contamination.

Material free from mercury contamination.

Approved acc. AD 2000-Merkblatt W0 and certified acc. to Pressure Equipment Directive (97/23/EC) by TUEV NORD; notified body, reg.no. 0045.

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 9001:2008.



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