



**CERTIFICATE**

**No. A/15-492089**

**Rev 00**

**Date 2015-04-10**

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INSPECTION CERTIFICATE acc to  
EN 10 204 3.1

Processkontroll Items AB  
Box 2088  
444 02 STORA HÖGA  
SWEDEN

INSPECTION STAMP  
QA-TUBE

|                            |                              |                           |                    |                                 |
|----------------------------|------------------------------|---------------------------|--------------------|---------------------------------|
| <b>Customer References</b> |                              | <b>Sandvik References</b> |                    |                                 |
| 751732                     | Customer order<br>2015-04-10 | Order No.<br>401859       | Subs No.<br>589081 | ABSMT Dispatch note<br>44788/54 |
| 003-00991                  | ITEMS                        | ABSMT No.<br>300-28373    | C.Code<br>15       |                                 |

|   |  |
|---|--|
| <b>Material description</b><br>SEAMLESS STAINLESS COLD FINISHED<br>HYDRAULIC TUBING | <b>Steel/material Designations</b><br>Sandvik<br>3R60<br>EN no<br>1.4435 |
| <b>Steel making process</b><br>Electric furnace                                     | AISI<br>TP316/TP316L   |

**Technical requirements**  
 ASTM A-213-13 AW, ASME SA-213-ED-13 AW, ASTM A-269-13  
 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   | Pieces | Kg   | M          |
|----|-------------------------------|--------|-------|--------|------|------------|
| 01 | THT-3R60-16-1<br>16.00 X 1.00 | 048102 | 93451 | 10     | 23.0 | 60.00      |
|    |                               |        |       | Total  | 10   | 23.0 60.00 |

  

|                    |          |                   |         |
|--------------------|----------|-------------------|---------|
| <b>KEY TO HEAT</b> |          | <b>KEY TO LOT</b> |         |
| Heat Code          | Heat No. | Lot Code          | Lot No. |
| 048102             | 540252   | 93451             | 178952  |

  

**TEST RESULTS**

**Chemical composition (weight%)**

| Heat   | C     | Si   | Mn   | P     | S     | Cr    | Ni    | Mo   |
|--------|-------|------|------|-------|-------|-------|-------|------|
| 048102 | 0.019 | 0.45 | 1.65 | 0.027 | 0.009 | 17.56 | 13.11 | 2.54 |
|        | N     |      |      |       |       |       |       |      |
| 048102 | 0.037 |      |      |       |       |       |       |      |

  

**Chemical composition, product (weight%)**

| Heat   | C     | Si   | Mn   | P     | S     | Cr    | Ni    | Mo   |
|--------|-------|------|------|-------|-------|-------|-------|------|
| 048102 | 0.021 | 0.47 | 1.64 | 0.028 | 0.008 | 17.54 | 13.02 | 2.54 |
|        | N     |      |      |       |       |       |       |      |
| 048102 | 0.034 |      |      |       |       |       |       |      |

**Quality assurance - Lars-Åke Bergqvist / 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" |
| 93451 | 257            | 298   | 544              | 45         | 42 |
|       | 240            | 279   | 539              | 46         | 41 |

**Hardness test**

| Lot   | Min | Max |
|-------|-----|-----|
|       | HRB | HRB |
| 93451 | 54  | 57  |

**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 TP 316/TP 316L EN 1.4435 M S NDE 16.00 X 1.00 MM HT 540252 SG LOT 178952 MADE BY SANDVIK \* QA-TUBE\*

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.

No unauthorized alterations. The contents of this Inspection Certificate may not be modified or revised in any way without the prior written approval of AB Sandvik Materials Technology. Unauthorized alterations to the Inspection Certificate, including introduction of false, fictitious or fraudulent statements or entries, may be punishable by fines, imprisonment, or both. This Inspection Certificate may be copied only in the manner and for the purposes specified in Section 6 of EN 10204:2004. Contravention of this notice will be prosecuted to the fullest extent of applicable law.

The certificate is produced with EDP and valid without signature.



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TEST RESULTS TRANSFERRED FROM CERTIFICATE NO 46372 REV 01