

B QUALIFICATIONS

- b1** Welders and operators qualification (EN ISO 9606-1 [5]/ EN ISO 14732 [12])
- for the process defined in **b2**
- b2** Welding procedures specifications (WPS) and qualification (WPQR) - (EN ISO 15607 [14]/ EN ISO 15609 series [15]/ EN ISO 15614 series [16])
- for welds, overlay/cladding welds, and prior repair by welding (including excavation mapping, if relevant).
- b5** NDT personnel
NDT laboratory shall fulfill the requirements of standard EN ISO/IEC 17025 [17]. The NDT inspection organization shall fulfill the requirements of standard EN ISO 17020 (EN 45004) [18]. The testers shall be qualified in general in accordance with at least level 2 of Standard EN ISO 9712 [6] or a corresponding qualification system. See also YVL E.12.[1] (REQ-C5-19)

The non-destructive testing requirements shall be at least in accordance to European (EN) standard requirements. Only personnel qualified and certified in accordance with EN ISO 9712 [6] or equivalent standard, at least Level 2 shall perform NDT testing and evaluate testing results. (REQ-C5-50)

C NON DESTRUCTIVE TESTS

In case of heat treatment, all NDT of welds to be made minimum of 48 hours after heat treatment

- c1/c2/c3/c4/c5** Liquid penetrant test (PT/DPT) / Magnetic particle test (MT/MPE) / Eddy current test (ET) / Radiographic test (RT) / Ultrasonic test (UT)
(when a choice is given, the method shall be selected as permitted in the relevant codes & standards. MT is preferable, PT when MT is not appropriate)

Tests performed when requested in Material Procurement Code or Manufacturer's Specification, but with a minimum of:

- 1) Procurement of raw materials
 - seamless pipes: 100 % UT or ET for longitudinal and transversal discontinuities.
 - welded pipes: 100 % UT or ET for longitudinal and transversal discontinuities. If the test is not practicable on finished pipes it shall be substituted by 100 % UT of plates, and 100 % UT or RT of longitudinal welds
- fittings:
 - . 100 % UT or RT of welds (if any on procurement)
 - . spheres, Y pieces, elbows, tees, caps, reducers: 100 % UT
 - . stainless steel fittings formed from straight pipes: PT on all external surface on 10% of each type and size of fittings (EN ISO 23277 [19] quality level 1)