

ULTRASONIC EXAMINATION (UT) NON-ENCODED MANUAL QUALIFICATION CARD
CRITERION AND MINIMUM REQUIREMENTS

Single Side Pipe Weld Ultrasonic Performance Area

A minimum of 24 single side pipe welds shall be examined and documented on the attached applicable ULTRASONIC PERFORMANCE AREA form as follows. Once the minimum requirements are satisfied, the level III may require more examinations to assure candidate proficiency:

- 1) Examine no more than 10 joints of any one of the following materials: stainless steel (SS), ferritic (Fe), and dissimilar metal/bi-metallic (DM).
- 2) One half the 24 pipe welds (12) shall have a wall thickness schedule 60 or greater and the other 1/2 (12) shall be schedule 40 or less.
- 3) One third of the 24 pipe welds (8) shall have a diameter >1.5" to 4" nominal pipe size, another 1/3 (8) shall be >4" to 12" nominal pipe size and the remaining 1/3 shall be >12" nominal pipe size.
- 4) Five each 0, 45, 60, and 70-degree beams shall be used to examine the 24 single side pipe weld set.
- 5) In addition to the 24 single side pipe weld examinations, another 24 calibrations shall be performed using the same parameters as above.

Notes:

- (1) Welds with dual side access may also be used for single side access provided access to one side is blocked.
- (2) The individual must demonstrate the ability to detect, size and identify flaws such as slag, lack of fusion, lack of penetration, porosity and cracks. Must also be able to identify and discriminate geometric reflectors.
- (3) Scans shall include axial and circumferential directions.

Double Side Pipe Weld Ultrasonic Performance Area

A minimum of 18 double side pipe welds shall be examined and documented on the attached applicable ULTRASONIC PERFORMANCE AREA form as follows. Once the minimum requirements are satisfied, the level III may require more examinations to assure candidate proficiency:

- 1) Examine no more than 8 joints of any one of the following materials: stainless steel (SS), ferritic (Fe), and dissimilar metal/bi-metallic (DM).
- 2) One half the 18 pipe welds shall have a wall thickness schedule 60 or greater and the other 1/2 shall be schedule 40 or less.
- 3) One third of the 18 pipe welds shall have a diameter >1.5" to 4" nominal pipe size, another 1/3 shall be >4" to 12" nominal pipe size and the remaining 1/3 shall be >12" nominal pipe size.
- 4) Five each 0, 45, 60, and 70-degree beams shall be used to examine the 18 single side pipe weld set.
- 5) In addition to the 18 single side pipe weld examinations, another 18 calibrations shall be performed using the same parameters as above.

Notes:

- (1) The individual must demonstrate the ability to detect, size and identify flaws such as slag, lack of fusion, lack of penetration, porosity and cracks. Must also be able to identify and discriminate geometric reflectors.
- (2) Scans shall include axial and circumferential directions.

VESSELS

Each configuration below shall be examined at least once at a thickness <2" and once at a thickness ≥ 2 ".

- 1) Head to shell (Scan at least 3 feet or complete weld whichever is less)
- 2) Shell welds (Scan at least 3 feet or complete weld whichever is less)
- 3) Nozzle to shell (Scan at least 90 degrees' circumference)
- 4) Nozzle Inner Radius (at least 2 components required)

Notes:

- (1) Above exams shall use multiple angle beams including skew in accordance with the procedure.
- (2) In addition to the examination of the above components, 2 more calibrations shall be performed for each configuration and specified thickness totaling 8 additional calibrations.

Bolting

Perform a minimum of 2 examinations of at least one the following:

- 1) Bore Probe
- 2) Zero Wave

Straight Beam (A-Scan)

Perform a minimum of at least 2 each of the following:

- 1) Lamination (Detection and sizing laminations)
- 2) Depth of weld flaw
- 3) Water/Solid level (Demonstrate water/void presence)

Material Thickness Measurements

Perform Flow Accelerated Corrosion (FAC) for at least 22 components as follows:

- 1) At least 10 elbows ($\frac{1}{2}$ Digital, $\frac{1}{2}$ A-Scan)
- 2) At least 6 "T" Joints ($\frac{1}{2}$ Digital, $\frac{1}{2}$ A-Scan)
- 3) At least 6 Straight Pipe Components ($\frac{1}{2}$ Digital, $\frac{1}{2}$ A-Scan)

Perform thickness measurements other than FAC:

- 1) 25 measurements $< \frac{1}{4}$ inch
- 2) 25 measurements $\frac{1}{4}$ inch or greater

Notes:

- (1) Analyze for accuracy and data quality