

NDT Procedure for Radiography Inspection

A Nondestructive testing (NDT) Procedure suitable for General Industrial Radiography Inspections. This is a sample RT procedure and may be required to be modified as per specific requirements.

NDT Procedure No: TNE-DOC-RT-06 Rev '0'



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**PROCEDURE FOR
RADIOGRAPHIC EXAMINATION**

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1.0 SCOPE

1.1 This procedure covers the technique, acceptance standard for radiographic testing of castings and welding.

2.0 APPLICABLE STANDARD

- 2.1 ASME Section V Article 2.
- 2.2 QAP as per Customer.
- 2.3 ASME Section VIII DIV I & 2.
- 2.4 ASTM E-9, E-155, E-186, E-446, E-689, E-1030, E-1648, E-1742.

3.0 EQUIPMENT & ACCESSORIES

- 3.1 X-Ray / Gamma Ray - Source of radiation.
- 3.2 Industrial X-Ray Film. Type 1 or 2 ASTM E-1815.
- 3.3 Film Holders and cassettes.
- 3.4 X-ray Film Viewer.
- 3.5 IQI as per ASME Section V article 2 table 276.
- 3.6 Processing - Developer, Fixer & wetting agent.
- 3.7 Exposure charts / scale.

3.0 OPERATION QUALIFICATION

4.1 The Radiographic examiner should be qualified and certified confirming to recommended practice as per SNT - TC-IA.

5.0 TERMINOLOGY

5.1 For definitions of terms used in the test method is as per ASTM E1316.



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6.0 PROCEDURE

6.1 Time of Examination ~ Radiography may be performed prior or after heat treatment and in rough, machined or finished conditions.

6.2 Surface preparation ~ The surface shall be prepared as necessary to remove any conditions that could mask or be confused with the image of any discontinuity.

6.3 Source to film distance ~ Source to film distance should be taken care of the geometric unsharpness. Geometric unsharpness should not be greater than one percent of the maximum part thickness being interpreted on radiograph, or 0.0070", whichever is less.

6.4 Direction of Radiation ~ The direction of radiation shall be governed by the geometry of the material and the radiographic coverage and quality requirements stipulated by the applicable job. Wherever Practicable, place the central beam of the radiation perpendicular to the surface of the film.

6.5 Back scattered radiation protection ~ Radiation emanating from surfaces behind the film i.e walls, floors, etc. serves to reduce radiographic contrast and may produce undesirable effects on radiographic quality. A lead sheet placed behind the film generally furnish adequate protection against back scattered radiation.

6.6 Location Markers ~ The radiographic image of the location markers shall appear on the film without interfering the interpretation. These marker positions shall be marked on the material and the position of the markers shall be maintained on the part during the radiographic cycle

7.0 PENETRATOR (I.Q.I)

7.1 One penetrometer shall represent an area within which radiographic densities do not vary more than +30% to -15% from the density measured through the body of the penetrometer.

7.2 Additional penetrometer should be used if variation in density is by more than -15% or +30% ranges.

7.3 The penetrometer should be kept on the source side of the casting being radiographed. If it is not possible penetrometer of next lower designation can be placed on film side with prefix F on the penetrometer.

7.4 IQI as per ASME Section V article 2 table 276.



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8.0 GEOMETRIC UN SHARPNESS (U_g)

8.1 U_g Shall be maintained as per Section V article 2 table T – 285R

9.0 RADIOGRAPHIC TESTING

9.1 Single wall technique -- Radiography shall be performed using this Technique in which radiation passes through only one wall.

9.2 Double wall technique --- This technique in which the radiation passes through both walls and both the walls are viewed for acceptance on the same film

10.0 PROCESSING

10.1 Processing according to the ASTM E 94.

11.0 RADIOGRAPHIC EVALUATION

11.1 Film Quality --- The radiograph Quality requirement as per ASTM E 746, E 1735.

11.2 Film Evaluation ---- The acceptance or rejection of the material is by comparing the radiographic image to the agreed upon acceptance criteria.

12.0 ACCEPTANCE CRITERIA

12.1 As per ASTM E 446 and ASME Section VIII D 1 & 2



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