

ISO 17636-1:2022-07 (E)

Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film

Contents		Page
Foreword		v
1 Scope	1	1
2 Normative references		1
3 Terms and definitions		2
4 Symbols and abbreviated terms		3
5 Classification of radiographic techniques		4
6 General preparations and requirements		4
6.1 Protection against ionizing radiation		4
6.2 Surface preparation and stage of manufacture		4
6.3 Location of the weld in the radiograph		5
6.4 Identification of radiographs		5
6.5 Marking		5
6.6 Overlap of films		5
6.7 Types and positions of image quality indicators (IQIs)		5
6.8 Evaluation of image quality		6
6.9 Minimum image quality values		6
6.10 Personnel qualification		7
7 Recommended techniques		7
7.1 Test arrangements		7
7.1.1 General		7
7.1.2 Single-wall penetration of plane objects (see Figure 1)		8
7.1.3 Single-wall penetration of curved objects with the source outside the object (see Figures 2 to 4)		8
7.1.4 Single-wall penetration of curved objects with the source inside the object for panoramic exposure (see Figures 5 to 7)		9
7.1.5 Single-wall penetration of curved objects with the source located off-centre and inside the object (see Figures 8 to 10)		10
7.1.6 Double-wall penetration and double-image evaluation (DWI) of pipes with the elliptic technique and the source and the film outside the object (see Figure 11)		11
7.1.7 Double-wall penetration and double-image evaluation (DWI) with the perpendicular technique and source and film outside the object (see Figure 12)		11
7.1.8 Double-wall penetration and single-image evaluation (DWSE) of curved objects for evaluation of the wall next to the film (see Figures 13 to 16)		11
7.1.9 Penetration of objects with different material thicknesses (see Figure 17 to 19)		13
7.2 Choice of tube voltage and radiation source		13
7.2.1 X-ray devices up to 1 000 kV		13
7.2.2 Other radiation sources		14
7.3 Film systems and metal screens		15
7.4 Alignment of beam		17
7.5 Reduction of scattered radiation		17
7.5.1 Metal filters and collimators		17
7.5.2 Interception of backscattered radiation		17
7.6 Source-to-object distance		18
7.7 Maximum area for a single exposure		20

7.8	Optical density of radiograph	20
7.9	Processing	21
7.10	Film viewing conditions	21
8	Test report	21
Annex A (normative) Number of exposures for acceptable testing of a circumferential butt weld		23
Annex B (normative) Minimum image quality values		28
Annex C (informative) Calculation of maximum X-ray tube voltages from Figure 20		35
Bibliography		36