

Procedure For Visual Inspection Of Welds to BS EN ISO 17637

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Authored By: Mr A Sample PCN Level 3	**Authorised For Use By:**
Signed: Mr A Sample	**Signed:**
Date:	**Date:**

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CONTENTS

1. Scope
2. Applicable documents
3. Safety
4. Personnel qualification
5. Description of method
6. Testing equipment
   6.1 Equipment calibration
7. Method of application
   7.1 General
   7.2 Visual testing of joint preparation
   7.3 Visual testing during welding
   7.4 Visual testing of the finished weld
   7.5 Visual testing of repaired welds
8. Testing procedure and evaluation of indications
   8.1 Testing procedure
   8.2 Acceptance criteria
9. Post examination cleaning
10. Inspection reports
11. Non-conformance

Appendix A – Revision history

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1. Scope

This procedure describes the method of visual inspection to be used for the inspection of fusion welded joints and associated materials i.e. weld preparations prior to welding. This procedure covers finished welds, dressed welds, weld joint preparations and partially complete welds in ferrous and non-ferrous metallic materials. This procedure is applicable for use on newly manufactured welds as well as in-service welds and also covers any repair work that may be required.

This procedure covers the general practices laid out in BS EN ISO 17637:2016 and uses BS EN ISO 5817:2023 as the acceptance criteria, although other acceptance criteria may be applied when specified by the customer or end user.

2. Applicable documents

BS EN ISO 9712:2022 Non-destructive Testing – Qualification and certification of NDT personnel.

BS EN ISO 17637:2016 Non-destructive testing of welds. Visual testing of fusion-welded joints

BS EN 1330-10:2003 Non-destructive testing. Terminology. Terms used in visual testing

BS EN ISO 5817:2023 Welding. Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded). Quality levels for imperfections

3. Safety

Personnel working to this procedure shall work in such a manner as to comply with the Health and Safety at Work etc. Act 1974.

Personnel working to this procedure shall at all times wear mandatory PPE; overalls, safety boots, hard hat, high visibility clothing, etc.

Any equipment that requires the use of mains electricity shall have successfully passed a PAT test within the last 12 months and be in good working condition.

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4. Personnel qualification

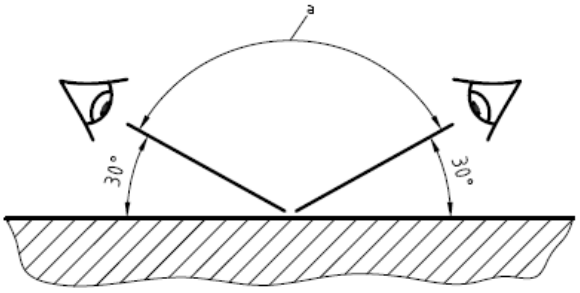
Operators trained and qualified in visual inspection to PCN (BS EN ISO 9712) Level 2 or equivalent covering the inspection of welds will be employed to carry out visual inspection in accordance with this procedure.

All personnel shall meet the eyesight requirements of BS EN ISO 9712 section 7.4 and shall have a valid eye test certificate issued within the last 12 months.

Documentation relating to operators shall be kept on file at the administration offices for review purposes.

5. Description of method

Visual inspection is a method used to detect cracks, cold laps, inclusions, porosity and other discontinuities on the surface of weldments, in the heat affected zone and in weld preparations prior to welding.



a Range

Figure 1

Visual inspection can take place using the naked eye only or using a wide variety of ancillary equipment to assist visual inspection, help in the measurement of dimensions and imperfections, inspect areas not accessible to the naked eye or to achieve suitable lighting conditions.

The viewing angle during examination should not deviate more than 60° from the line vertical to the surface being examined. The viewing distance should be approximately 300 mm. The viewing distance shall not be greater than 600 mm (see figure 1)

In order to comply with this procedure visual aids such as magnifying glasses with a maximum magnification of x5 may be used.

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6. Testing equipment

Remote inspection using mirrors, borescopes, fibre optic cables or cameras shall be considered when the access for testing in accordance with figure 1 is not possible or when specified by the customer / end user.

An additional light source is often used to increase the contrast and relief between imperfections and the background or to provide enough illumination to ensure that a satisfactory inspection can take place.

Where the result of visual testing is inconclusive, the visual test should be supplemented by other non-destructive testing methods for surface inspections.

The following equipment may be used as required.

- Magnifying glasses (up to x5 magnification)
- Supplementary lighting (e.g. torch)
- Rulers / tape measures / vernier gauge / callipers etc.
- TWI style multi-purpose gauge
- Surface comparator gauges
- Mirrors / scopes.
- White light meter (externally calibrated within the last 12 months).

Other equipment may be used as required for specialist applications. See BS EN ISO 17637 Annex A for further examples of equipment.

Verification / Calibration of measuring equipment

Basic measuring equipment (Rulers, tape measures, vernier gauge, callipers, etc) used shall be internally calibrated at least monthly against a suitable externally calibrated reference piece. Records of internal calibrations shall be kept in a register.

6.1 Equipment calibration

The equipment used must, where applicable, be calibrated or checked to ensure consistent functional performance and repeatability of the testing system.

Basic metrology measuring equipment such as rulers or callipers may be calibrated internally where applicable.

Light meters shall be externally calibrated within the last 12 months.

All equipment checks shall be recorded in the equipment check log.

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