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Guide for the Visual Inspection of Welds



American Welding Society



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Guide for the Visual Examination of Welds

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Abstract

This guide contains information to assist in the visual examination of welds. Included are sections on prerequisites, fundamentals, surface conditions, and equipment. Sketches and full-color photographs illustrate weld discontinuities commonly found in welds.



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Guide for the Visual Examination of Welds

1. General

1.1 Application. Information contained in this guide applies to the general duties and responsibilities of visual inspectors of weldments and is useful to them in carrying out their duties and responsibilities defined in particular codes or specifications. This document is primarily intended for those who are responsible for the final acceptance of weldments. However all welders, supervisors, technicians, and engineers who are required to routinely inspect work performed by them or under their authority will benefit from the use of this document. This document will provide general guidelines for the visual examination of weldments.

The inspector should be knowledgeable concerning each of the principles and methods of examination required on a particular weldment. It is the responsibility of those charged with the administration and supervision of inspection to make certain that the principles and methods set forth are properly understood and uniformly applied. This responsibility also includes the qualification and certification of inspectors, where such certification is required by codes, specifications, or civil laws. AWS QC1, *Standard for AWS Certification of Welding Inspectors*, indicates the importance AWS assigns to visual examination.

Contract documents should specify the requirements for visual examination. In the absence of such requirements, the manufacturer should be requested to establish, in writing, the extent and the methods of examination to be required.

Acceptance standards should be clearly understood by both the manufacturer and the buyer before any welding is started. This is not only to make more effective use of the examination methods but to prevent disagreement over whether a weldment is satisfactory and in accordance with the contract specifications.

1.2 Scope. This guide includes an outline of the fundamental prerequisites for personnel performing visual examination of welds. Such prerequisites include physical limitations or capabilities, as well as technical knowledge, training, experience, judgment, and certification.

This guide essentially provides an introduction to visual examination of welding. These examinations fall into three categories based on the time they are performed, as follows: (1) prior to welding, (2) during welding, and (3) after welding. An extensive treatment is provided on weld surface conditions, including reference to frequently used terminologies associated with *preferred* and *non-preferred* conditions. Visual examination may be performed by different people or organizations. Personnel performing welding examination include welders, welding supervisors, the contractor's welding inspector, the purchaser's examiner, or the regulatory inspector. For the purpose of simplicity, these individuals referred to as visual inspectors in the remainder of this standard in that they perform visual inspection. Fabrication documents, contract specifications, and regulatory agencies may specify who performs final inspections.

Also provided is a review of visual examination equipment aids routinely used, such as gauges and lighting equipment. Formal documentation of visual examination results is contained in Section 6, Records. Finally, the guide suggests additional reading or references, that may provide more detailed requirements for specific visual examination applications.

1.3 Safety and Health. This technical document does not address all welding and health hazards. Pertinent information can be found in ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, and other safety-related documents including federal, state, and local regulations.

1.4 References. The following documents are cited in this document. Copies may be obtained from the American Welding Society.