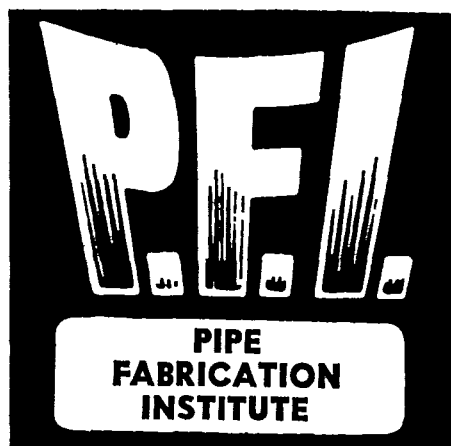


“Visual Examination” The Purpose, Meaning and Limitation of The Term

Prepared by
Pipe Fabrication Institute Engineering Committee



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“VISUAL EXAMINATION” THE PURPOSE, MEANING AND LIMITATION OF THE TERM

FOREWORD

The term “Visual Examination” is referred to in most codes and job specifications which cover the fabrication, erection and examination of piping assemblies. The precise definition and scope of the methods which are assumed to be included in “Visual Examination” are seldom found in these same codes and specifications. The misunderstanding of the meaning of the term “Visual Examination” and the examination methods it covers can become controversial resulting in inefficient flow of production and untimely delays.

By defining “Visual Examination” and the examination methods it covers in the following guideline, it is hoped that a working agreement between the customer and piping fabricator can be achieved.

1. Scope

- 1.1 This guideline covers the definition, purpose and limitations of the term “Visual Examination” when it is not otherwise completely described in a code or specification.

2. Definition

- 2.1 The term “Visual Examination” is assumed to mean using the unaided eye (or corrective lenses) to inspect the complete exterior and the readily accessible internal surface areas of piping assemblies or components.
- 2.2 “Readily Accessible” is defined as those surfaces that can be seen from a distance of not more than 24 inches and at an angle not less than 30 degrees to the surface to be examined. See sketches 1 & 2.

3. Requirements

- 3.1 The part shall be well lighted, with no shadows and essentially free of glare.
- 3.2 The area under observation shall be clean, free of all “loose” foreign materials, such as scale, sand, weld spatter and slag, cutting chips, etc.

4. Purpose

- 4.1 Visual examination is one of the most valuable methods of examination. It is easy to apply, fast, inexpensive, requires no special equipment and, when properly done, is capable of locating and subsequently eliminating a large portion of the common defects which may occur in pipe fabrication.
- 4.2 Visual examination is especially useful in revealing items such as incorrect materials, surface defects in components and unacceptable weld fit-ups. Such items can be detected through visual examination prior to welding.

- 4.3 Visual examination should be used to detect and evaluate accessible surface defects such as cracks, undercut, overlap, surface porosity, etc. It should be used to examine for appearance, cleanliness, contour and workmanship. Visual examination should also be used for the verification of final dimensions, straightness, preparation requirements and relation of procedures to materials.

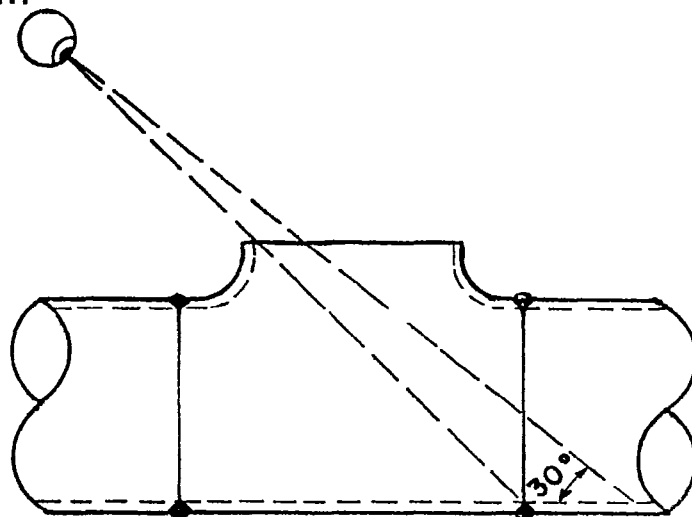
5. Limitations

- 5.1 Visual examination shall be confined to the portions of the piping assembly which are exposed to unobstructed observation with the unaided eye (or corrective lenses) before, during and after manufacture, fabrication and installation.
- 5.2 Visual examination shall be done by personnel who are qualified and experienced in the piping field and who are knowledgeable with the welding and fabrication techniques used in the industry.
- 5.3 Liquid penetrant, magnetic particle, ultrasonic, radiographic examinations, etc., are each separate nondestructive exam-techniques and are not forms of visual examinations as defined in this standard.
- 5.4 Examination carried out using different optical accessories, such as borescopes, mirrors, magnifying glasses and microscopes, form separate techniques of remote visual examination and are not visual examination as defined by this standard.

6. Acceptance Standards

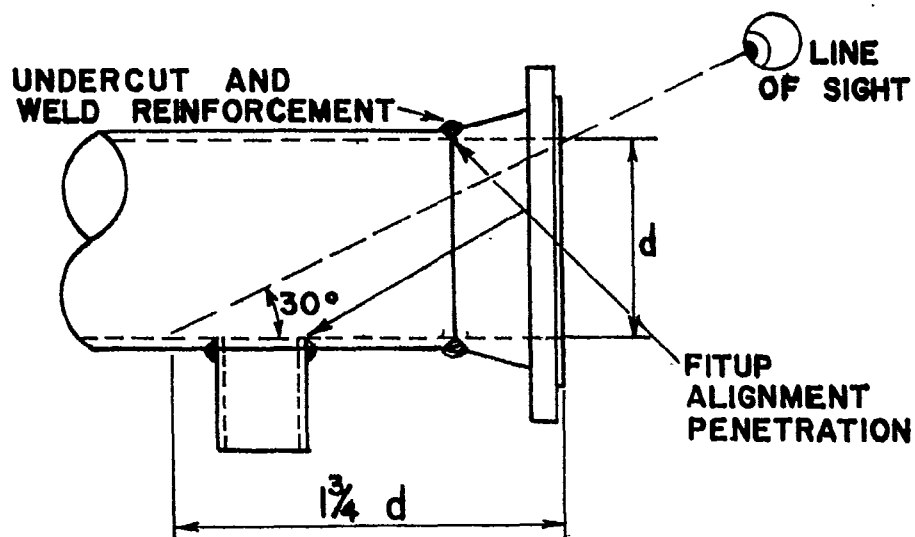
- 6.1 The acceptance standards for visual examination shall be as specified in the applicable code and design specifications.

LINE OF SIGHT
DIRECT VIEW
(VISUAL)



INTERNAL AREA SUBJECT TO VISUAL EXAMINATION

SKETCH NO. 1



INTERNAL AREA SUBJECT TO VISUAL EXAMINATION

SKETCH NO. 2

A current index of the latest revised ES Standards and Technical Bulletins is available from the Pipe Fabrication Institute.

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