

ANSI/MSS SP-55-2011



Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components

Visual Method for Evaluation of Surface Irregularities

Reference Version
(Not for Inspection)

Standard Practice
Developed and Approved by the
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Originally Published: April 1961

Current Edition Approved by MSS: September 2010

Current Edition Approved by ANSI/MSS Consensus Committee: August 2011

Current ANSI/MSS Edition Published: October 2011

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FOREWORD

The MSS SP-55, Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components – Visual Method for Evaluation of Surface Irregularities, was originally adopted in 1961. It was developed for the purpose of providing the industry with a uniform means for identifying various types of casting surface irregularities.

A set of 60 reference photographs illustrating these casting surface irregularities is included in this Standard Practice to permit a visual comparison of an actual casting surface with the reference photographs for the purpose of the establishing acceptable/unacceptable casting surface irregularities.

The format of this Standard Practice was revised in 1996 to be consistent with other MSS Standard Practices.

The 2006 revised edition included updates in the referenced standards, Annex A, to reflect current applicable dates and the updated addresses of the referenced publications organizations.

This 2011 revised American National Standard edition includes updates to the applicable organizations and referenced standards, indicating current dates, names, and addresses of the referenced publications or organizations within this Standard Practice. In addition, an Annex B has been introduced that contains the pre-existing set of 60 reference photographs, along with various editorial corrections that include Section 5.

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Manufacturers Standardization Society of the Valve and Fittings Industry

**QUALITY STANDARD FOR STEEL CASTINGS
FOR VALVES, FLANGES, FITTINGS, AND OTHER PIPING COMPONENTS**

VISUAL METHOD FOR EVALUATION OF SURFACE IRREGULARITIES

1. **SCOPE**

1.1 This Standard Practice is intended to supplement the requirements of ASTM Standard Specifications A216/A216M, A217/A217M, A351/A351M, A352/A352M, A389/A389M, A487/A487M, and A744/A744M, and to provide a series of reference photographs typical of the various surface irregularities common to steel pressure castings and illustrations of generally acceptable and generally rejectable quality. Table 1 of Section 5 is provided to show MSS interpretation as to the relationship between this Standard Practice and the levels of surface quality illustrated by the comparators and the associated photographs of the Castings Technology International (CTI), "Comparators for the Definition of Surface Quality of Steel Castings".

1.2 For additional nondestructive examinations defining quality of steel castings, this Standard Practice may be supplemented by the following MSS Standard Practices: SP-53, "Magnetic Particle Examination Method"; SP-54, "Radiographic Examination Method"; SP-93, "Liquid Penetrant Examination Method"; SP-94, "Ultrasonic Examination Method"; and SP-112, "Visual and Tactile Method".

2. **DEFINITION OF SURFACE QUALITY BY VISUAL INSPECTION**

2.1 Twelve general types of surface irregularities are characterized in the collection (see Section 3) with five examples being included for each type. The two examples in each case shown to the left illustrate acceptable degrees of the particular type of irregularity. The three examples to the right are characterized as containing unacceptable defects.

2.2 It is recognized that problems may be encountered in evaluating surfaces of castings over a wide range of size and section thickness using the same set of standards. **This guide attempts to minimize the size effect and is intended for general use for any 4 in. x 5 in. (100mm x 125mm) area.**

3. **REFERENCE PHOTOGRAPHS**

3.1 A set of 60 reference photographs illustrating various casting surface irregularities, which can be observed by visual inspection, is included herewith (see Annex B). These photographs are actual size examples of gradations involving acceptable and non-acceptable irregularities. It is intended that irregularities less pronounced than those shown as non-acceptable shall be accepted under this guide.

3.2 Photographs included are of actual castings and may exhibit surface irregularities other than the type characterized in the heading. Each type of surface irregularity shall be judged only against the series of photographs identified with the type.

4. **TERMINOLOGY FOR REFERENCE PHOTOGRAPHS**

4.1 It should be noted that all definitions and discussions of terminologies apply only to surface irregularities and not to internal defects. The types of surface irregularities illustrated in the reference photographs are as follows:

a) ***Type I – Hot Tears and Cracks***

Linear surface discontinuities or fractures caused by either internal or external stresses or a combination of both acting on the casting. They may