

MSS SP-93-2020

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

**Liquid Penetrant
Examination Method**

Standard Practice
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FOREWORD

This MSS Standard Practice, SP-93, *Quality Standard for Steel Castings and Forgings for Valves, Flanges, Fittings, and Other Piping Components – Liquid Penetrant Examination Method*, was originally adopted in 1982 for the purpose of providing a uniform method of Liquid Penetrant Examination. It was specifically developed for the valve/piping industry but may be used in any application where this type of examination is suitable.

This Standard Practice was reaffirmed in 1987 with essentially no changes.

The Third edition was reaffirmed in 1992 with essentially no changes.

The 1999 edition included minor revisions and was re-formatted to conform to MSS publication practices.

The 2008 edition included minor revisions and was re-formatted to conform to MSS publication practices.

The 2014 edition included editorial corrections, a clarification to Scope in Section 1, update of Section 7 and Table 1, and an update of Annex A references. It was also re-formatted to conform to current MSS publication practices.

This 2020 edition includes a new definition in Section 3.5, updated Annex A references, other minor revisions, and re-formatting to conform to current MSS publication practices.

This 2020 edition includes updates to the definitions in Section 3, updated Annex A references, other minor revisions, and re-formatting to conform to current MSS publication practices.

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Manufacturers Standardization Society of the Valve and Fittings Industry

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

LIQUID PENETRANT EXAMINATION METHOD

1. SCOPE

1.1 This Standard Practice provides methods and acceptance standards for liquid penetrant examination of steel castings and forgings for valves, flanges, fittings and other piping components. It is applicable to examination of repairs as well as to initial examination of castings and forgings.

1.2 The methods contained in this Standard Practice provide uniform procedures that will produce satisfactory and consistent results upon which the Acceptance Standards of Table 1 may be used.

1.3 This Standard Practice includes the examination of pressure containing castings and forgings.

2. REFERENCES

ASNT SNT-TC-1A, *Personnel Qualification and Certification in Nondestructive Testing*

ASTM E165/E165M, *Standard Practice for Liquid Penetrant Examination for General Industry*

3. DEFINITIONS

3.1 **Indication** – The visible bleed-out of liquid from a discontinuity.

3.2 **Linear Indication** – An indication in which the length is three (3) or more times the width.

3.3 **Pressure Containing Part** – A part whose failure would permit the contained fluid to escape to the atmosphere. For valves, the body and bonnet (cover) and end pieces (of multi-piece valve bodies, e.g., ball valves) shall be considered the pressure containing parts.

3.4 **Rounded Indication** – An indication which is circular or elliptical, with its length less than three (3) times its width.

3.5 **Surface Conditioning** – Metal removing processes such as filing, buffing, scraping, mechanical milling, drilling, reaming, grinding, liquid honing, sanding, Lathe cutting, tumble or vibratory deburring, and abrasive blasting, including abrasives such as glass beads, sand, aluminum oxide, lignocellulose pellets, metallic shot, etc., are often used to remove such soils as carbon, rust and scale, and foundry adhering sands, as well as to deburr or produce a desired cosmetic effect on the part.

4. PROCEDURE

4.1 All exterior and accessible interior surfaces of the pressure containing parts shall be examined by the liquid penetrant method. Interior surfaces not accessible because of configuration, such as small holes or bores, need not be examined. Examination may occur prior to machining or after machining at the manufacturer's option.

4.2 Liquid penetrant examination procedure shall be in accordance with ASTM E165/E165M.