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NON-DESTRUCTIVE TESTING PENETRANT TESTING MEDIA



STANDARDS ASSOCIATION OF AUSTRALIA
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The following interests were represented on the committee responsible for the preparation of this standard:

Australian Atomic Energy Commission
Australian Institute for Non-destructive Testing
Australian Pipeline Industry Association
Australian Welding Institute
Bureau of Steel Manufacturers of Australia
Commonwealth Aircraft Corporation Limited
Confederation of Australian Industry
Department of Defence
Department of Industrial Relations, N.S.W.
Department of Labour and Industry, Vic.
Electricity Supply Association of Australia
Institute of Australian Foundrymen (N.S.W. Division)
Metal Trades Industry Association of Australia
National Association of Testing Authorities of Australia
Pipeline Authority
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AUSTRALIAN STANDARD

**NON-DESTRUCTIVE TESTING
PENETRANT TESTING MEDIA**

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PREFACE

This standard was prepared by the Association's Committee on Non-destructive Testing of Metals and Materials, at the request of the Metals Standards Board to provide a standard whereby penetrant testing media can be assessed for performance.

Initially, it was proposed that this standard would form part of the standard 'Methods for Penetrant Testing of Products and Components' (issued for public review as DR 75071). However, in order to use a uniform approach and to avoid requirements for testing media being included in a standard for test methods, the committee resolved to prepare a separate standard. This action was deemed necessary to avoid confusion in the purchase and use of penetrant testing media.

During preparation of this standard, the following standards were considered:

ASTM E 165	Methods for Liquid Penetrant Inspection
ISO/DIS 3452	Non-destructive Testing—Penetrant Inspection— General Principles
ISO/DIS 3879	Welded Joints—Recommended Practice for Liquid Penetrant Testing
BS M39	Method for Penetrant Inspection of Aerospace Material and Components
MIL-1-25135C—1959	Inspection Materials, Penetrant

The classification system included has been essentially aligned with that included in ISO/DIS 3452. However, the committee felt there was no need to include a separate classification for dual-purpose penetrants because such penetrants are expected to comply with the requirements for each individual classification.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
NON-DESTRUCTIVE TESTING—PENETRANT TESTING MEDIA

FOREWORD

Penetrant testing media are generally marketed as a complete testing system and brands should not be mixed.

Oil-phase penetrant testing system materials and other classes of material may be compatible with other brands of similar material. However, the responsibility of assuming that mixed material continues to comply with the requirements of this standard rests with the user of mixed products.

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for penetrant testing media for use in non-destructive testing performed in accordance with AS 2062.

NOTE: Guidelines for the purchasing of penetrant testing media are set out in Appendix A.

1.2 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 1449	Wrought Alloy Steels—Stainless and Heat-resisting Steel Plate, Sheet and Strip
AS 1524	Cylindrical Tinplate Cans with Friction Closures
AS 1525	Tinplate Cans with Threaded Closures
AS 1595	Cold-rolled Unalloyed Low Carbon Steel Sheet and Strip
AS 1865	Wrought Aluminium and Aluminium Alloy Drawn Wire, Rod, Bar and Strip for General Engineering Purposes
AS 1929	Non-destructive Testing—Glossary of Terms
AS 2062	Methods for Non-destructive Penetrant Testing of Products and Components
AS 2106	Methods for the Determination of the Flashpoint of Flammable Liquids (Closed Cup)
AS 2193	Methods for Calibration and Grading of Force-measuring Systems of Testing Machines
AS 2278	Metal Aerosol Containers—Classification, Filling and Testing
BS 4489	Method for Assessing Black Light Used in Non-destructive Testing
ASTM B 80	Magnesium Alloy Sand Castings.

1.3 DEFINITIONS. For the purpose of this standard, the terms and definitions given in AS 1929 apply.

1.4 CLASSIFICATION OF PENETRANT TESTING MEDIA.

1.4.1 Penetrants. Penetrants shall be classified as follows:

- (a) Fluorescent penetrants.
- (b) Visible dye penetrants (non-fluorescent).

These penetrants shall be further sub-classified as follows:

- (i) Water-washable penetrants.

- (ii) Solvent-removable penetrants.

- (iii) Post-emulsifiable penetrants.

1.4.2 Emulsifiers. Emulsifiers shall be classified as follows:

- (a) Water-based (hydrophilic) emulsifiers.
- (b) Oil-based (lipophilic) emulsifiers.

1.4.3 Developers. Developers shall be classified as follows:

- (a) Dry-powder developers.
- (b) Liquid developers:
 - (i) Water-based
 - (ii) Solvent-based.

1.5 TOXICITY. Testing media shall not contain compounds the degree of hazard of which has not been appraised by a recognized occupational health organization, e.g. National Health and Medical Research Council, nor shall any combination of media have any adverse effect on the health of personnel when used for its intended purpose in accordance with the recommendations of the manufacturer. The odour shall not be nauseating upon limited exposure to vapour.

1.6 CORROSION PROPERTIES. When tested in accordance with Appendix B, the penetrant testing media shall not etch or corrode the metals tested. Slight tarnishing of magnesium is not to be a cause for rejection of the media.

1.7 FLASHPOINT. When determined in accordance with AS 2106, the flashpoint of any component of penetrant testing media shall be not less than 50°C (closed cup).

1.8 LONG TERM STORAGE PROPERTIES. Sealed containers of testing media shall be capable of being stored for a period of not less than 12 months within the temperature range of -10°C to 50°C without impairment of the performance requirements of this standard.

1.9 TEMPERATURE STABILITY (PENETRANTS AND EMULSIFIERS). When tested in accordance with Paragraph D3 of Appendix D, there shall be no precipitation or separation of constituents of penetrant testing media.

1.10 SIMULATED TANK LIFE (PENETRANTS AND EMULSIFIERS). When tested in accordance with Paragraph D4 of Appendix D, there shall be no precipitation, separation of constituents or formation of a scum on the surface of testing media.