AS ISO 3452.6:2020

Australian STANDARD®

Non-destructive testing — Penetrant testing

Part 6: Penetrant testing at temperatures lower than 10 °C

STANDARDS Australia

AS ISO 3452.6:2020

This Australian Standard® was prepared by MT-007, Non-Destructive Testing Of Metals And Materials. It was approved on behalf of the Council of Standards Australia on 24 February 2020.

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The following are represented on Committee MT-007:

Australasian Thermographers Association
Australian Institute for Non-Destructive Testing
Australian Nuclear Science and Technology Organisation
Austroads
Engineers Australia
Institute of Electrical Inspectors
National Aerospace Non-Destructive Testing Board of Australia
Weld Australia

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Part 6: Penetrant testing at temperatures lower than 10 °C

Originated as part of AS B260.3A—1968.
Revised and redesignated as AS 2062—1977.
Revised, amalgamated with AS 2565—1982 and redesignated as AS 2062—1997.
Revised and redesignated as AS ISO 3452.6:2020.

Preface

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee MT-007, Non-Destructive Testing of Metals and Materials, to supersede AS 2062—1997, *Non-destructive testing — Penetrant testing of products and components.*

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to specify —

(a) the testing requirements particular to applications at low temperatures (lower than + 10 °C), and

(b) the method for qualification of suitable testing products.

This Standard applies only to materials qualified for the relevant temperature range used in accordance with the manufacturer's instructions.

This Standard is identical with, and has been reproduced from, ISO 3452-6:2008, *Non-destructive testing — Penetrant testing — Part 6: Penetrant testing at temperatures lower than 10 °C*.

As this document has been reproduced from an International Standard, the following applies:

(i) In the source text "this part of ISO 3452" should read "this Australian Standard".

(ii) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms "normative" and "informative" are used in Standards to define the application of the appendices or annexes to which they apply. A "normative" appendix or annex is an integral part of a Standard, whereas an "informative" appendix or annex is only for information and guidance.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3452–6 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 138, *Non-destructive testing*, in collaboration with ISO Technical Committee TC 135, *Non-destructive testing*, Subcommittee SC 2, *Surface methods,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 3452 consists of the following parts, under the general title *Non-destructive testing — Penetrant testing*:

— *Part 1: General principles*

— *Part 2: Testing of penetrant materials*

— *Part 3: Reference test blocks*

— *Part 4: Equipment*

— *Part 5: Penetrant testing at temperatures higher than 50 °C*

— *Part 6: Penetrant testing at temperatures lower than 10 °C*

This corrected version incorporates the following corrections:

— in the Introduction, reference to EN 571-1 has been replaced with reference to ISO 3452-1;

— the normative reference ISO 3452-1 carries a footnote stating its equivalency to EN 571-1;

— in 3.2, list item d), the phrase “this standard temperature range” has been replaced with “the working temperature range”;

— in 3.4, the second sentence of the first paragraph, the phrase “materials testing” has been replaced with “testing materials”;

— 4.1, list items c) and d), are made requirements, and the last sentence of item d) reworded for greater clarity;

— in 4.2.3, the four occurrences of the word “cloth” have been replaced with “cloths”;

— in the second paragraph of 5.1, the requirement that the degreaser be water soluble has been replaced by the statement “the degreaser has to be soluble in water”;

— minor editorial corrections are made in 4.2.2 and 5.4.2.

Introduction

Temperatures lower than 10 °C can affect the properties of penetrant test materials. The use of penetrant materials and the testing of penetrant materials within the temperature range 10 °C to 50 °C are the subject of ISO 3452-1 and ISO 3452-2. This part of ISO 3452 addresses materials and their use at lower temperatures than 10 °C.

This part of ISO 3452 introduces the concept of process times being linked to working temperatures and accordingly users are recommended to ensure that testing products are correctly associated with process parameters in written instructions (procedures).

Testing products may be specifically developed and qualified for low temperature use but testing products qualified for use at normal temperatures, in some cases, may also be suitable for lower temperature use.

NOTES

Australian Standard®

Non-destructive testing — Penetrant testing

Part 6: Penetrant testing at temperatures lower than 10 °C

1 Scope

This part of ISO 3452 specifies the testing requirements particular to applications at low temperatures (lower than + 10 °C) as well as the method for qualification of suitable testing products. It applies only to materials qualified for the relevant temperature range used in accordance with the manufacturer's instructions.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3059, *Non-destructive testing — Penetrant testing and magnetic particle testing — Viewing conditions*

ISO 3452-1, *Non destructive testing — Penetrant testing — Part 1: General principles* [1)]

ISO 3452-2, *Non-destructive testing — Penetrant testing — Part 2: Testing of penetrant materials*

ISO 3452-3, *Non-destructive testing — Penetrant testing — Part 3: Reference test blocks*

3 Low temperature penetrant testing

3.1 General principles

The general principles of ISO 3452-1 shall apply unless otherwise stated in this part of ISO 3452 or in the manufacturer's instructions.

Qualification tests are carried out by the manufacturer and if products are used within the stated range, no further tests are needed on site.

3.2 Technical principles

Depending on the temperature range, some specific problems might be encountered:

a) moisture, or even ice, on the test object;

b) lower evaporation rate of solvents and of non-aqueous wet developers than at higher temperatures;

c) when spray cans are used, pressure and spray quality may be affected;

d) some penetrants may precipitate. In such a case, tests shall be carried out within the standard temperature range (10 °C to 50 °C) if the penetrants are to be used in the working temperature range.

3.3 Safety precautions

All relevant European, national and local regulations pertaining to health and safety, environmental requirements etc. shall be observed.

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1) ISO 3452-1 is equivalent to EN 571-1.