



Methods of testing bitumen and related roadmaking products

Method 18: Determination of softening point (ring and ball method)



AS 2341.18:2020

This Australian Standard® was prepared by CH-025, Bitumen And Related Products (For Roadmaking). It was approved on behalf of the Council of Standards Australia on 6 April 2020.

This Standard was published on 17 April 2020.

The following are represented on Committee CH-025:

- Australian Airports Association
- Australian Asphalt Pavement Association
- Australian Chamber of Commerce and Industry
- Australian Institute of Petroleum
- Australian Road Research Board
- Austroads
- National Association of Testing Authorities Australia

This Standard was issued in draft form for comment as DR AS 2341.18:2019.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:
www.standards.org.au

ISBN 978 1 76072 818 2



Methods of testing bitumen and related roadmaking products

Method 18: Determination of softening point (ring and ball method)

Originated as AS 2341.18—1980.
Previous edition 1992.
Third edition 2020.

COPYRIGHT

© Standards Australia Limited 2020

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Test Method was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee CH-025, Bitumen and Related Products (for Roadmaking), to supersede AS 2341.18—1992.

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

The objective of this Test Method is to specify procedures for the determination of the softening point of bitumen and related roadmaking products.

This Test Method references, ASTM D36/D36M-14e1, *Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)*, for use in Australia, subject to modifications set out in [Appendix A](#).

[Appendix A](#) lists the variations to ASTM D36/D36M-14e1, for the application of this Test Method in Australia.

Users of this Test Method are advised that they must purchase ASTM D36/D36M-14e1 in addition to this Test Method.

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

Contents

Preface ii

1 Scope 1

2 Application 1

3 Normative references 1

4 Terms and definitions 1

5 Operation 1

Appendix A (normative) Variations to ASTM D36/D36M-14e1 for Australia 2

NOTES

Australian Standard[®]

Methods of testing bitumen and related roadmaking products

Method 18: Determination of softening point (ring and ball method)

1 Scope

The objective of the Test Method is to set out two procedures which use a ring and ball apparatus for the determination of the softening point of bitumens and related roadmaking products. The materials concerned have a softening point in the range 30 °C to 157 °C.

2 Application

ASTM D36/D36M-14e1 is the 2014 edition. Only the 2014 edition shall be used in accordance with this Test Method.

3 Normative references

The following normative documents are referred to in this Standard in addition to those referenced in ASTM D36/D36M-14e1. The following documents are referred to in the text in such a way that some or all of the content constitutes requirements of this Standard.

AS/NZS 2341.21, *Methods of testing bitumen and related roadmaking products, Method 21: Sample preparation*

AGPT-T102, *Protocol for Handling Modified Binders in Preparation for Laboratory Testing*

4 Terms and definitions

For the purpose of this document the terms and definitions in this Test Method and ASTM D36/D36M-14e1 apply.

4.1

may

indicates the existence of an option

4.2

shall

indicates that a statement is mandatory

4.3

should

indicates a recommendation

5 Operation

The requirements of ASTM D36/D36M-14e1 shall apply subject to the modifications set out in [Appendix A](#) for Australian conditions.

Appendix A
(normative)

Variations to ASTM D36/D36M-14e1 for Australia

A.1 Scope

This Appendix lists the normative variations to ASTM D36/D36M-14e1.

A.2 Variations

The following modifications are required for Australian conditions:

Element	Instruction/New text
CI 1.1	<i>Delete</i> clause and <i>replace</i> with the following: This Test Method determines the softening point of bitumen and polymer modified binders (PMBs) in the range from 30 °C to 157 °C using a ring-and-ball apparatus immersed in distilled water (30 °C to 80 °C) or glycerol (above 80 °C to 157 °C).
CI 1.2	<i>Delete</i> clause and <i>replace</i> with the following: Values are stated in either SI units or imperial units in this Test Method. All measurements shall be made using SI units.
CI 2.1	<i>Delete</i> clause and <i>replace</i> with the following: The following documents are referred to in this Test Method: AS/NZS 2341.1, <i>Methods of testing bitumen and related roadmaking products, Part 1: Precision data — Definitions</i> AS/NZS 2341.21, <i>Methods of testing bitumen and related roadmaking products, Method 21: Sample preparation</i> AGPT-T102, <i>Protocol for Handling Modified Binders in Preparation for Laboratory Testing</i> ASTM E1, <i>Standard Specification for ASTM Liquid-in-Glass Thermometers</i> NOTE—For referenced ASTM standards, visit the ASTM website, www.astm.org , or contact ASTM Customer Service at service@astm.org . For <i>Annual Book of ASTM Standards</i> volume information, refer to the standard’s Document Summary page on the ASTM website.
CI 6.1.2	<i>Delete</i> clause and <i>replace</i> with the following: <i>Glycerol.</i> Grade of glycerol which has a purity ≥ than 99 %.
CI 6.2.1	First sentence, <i>delete</i> “glycerin” and <i>replace</i> with “glycerol”.
Section 8	<i>Delete</i> section, including Clause 8.1.
CI 9.1	<i>Delete</i> clause, including Note 3, and <i>replace</i> with the following: Bitumen samples shall be prepared for testing in accordance with AS/NZS 2341.21. Polymer modified binder (PMB) samples shall be prepared for testing in accordance with AGPT-T102.
CI 9.1.1	<i>Delete</i> clause.
CI 9.1.2	<i>Delete</i> clause.
CI 9.1.3	<i>Delete</i> clause.
CI 10.1.2	<i>Delete</i> “USP glycerin” and <i>replace</i> with “Glycerol”.
CI 10.1.3	<i>Delete</i> clause.
CI 10.2	First sentence, <i>delete</i> “in the laboratory hood”.
CI 11.1	<i>Delete</i> clause and <i>replace</i> with the following:

Element	Instruction/New text
	Calculate the softening point of the material by averaging the softening point results obtained for the two rings.
Cl 11.2	Delete clause and <i>replace</i> with the following: Depending on the bath medium used, choose Clause 11.2.1 or Clause 11.2.2.
Cl 11.2.1	Delete clause and <i>replace</i> with the following: For softening point results obtained in the water bath: if the mean result obtained is between 28 °C and 80 °C report the result. For mean softening point results above 80 °C, reject the result as invalid and repeat the determination in a glycerol bath.
Cl 11.2.2	Delete clause and <i>replace</i> with the following: For softening point results obtained in the glycerol bath: if the mean result is 84 °C or below repeat the determination in a water bath. If the mean water bath result is 80 °C or below report that result otherwise report the mean result obtained in the glycerol bath.
Cl 11.3	Delete clause.
Cl 11.3.1	Delete clause.
Cl 12.1	Delete “or corrected mean”.
Cl 12.2	Delete “or corrected mean”.
Cl 12.101 (new)	After Clause 12.3, <i>add</i> the following new clause: 12.101 Reference to this Test Method, i.e. AS 2341.18.
Cl 13.1	Delete clause and <i>replace</i> with the following: The following criteria should be used for determining the acceptability of results for bitumen samples, as specified in AS/NZS 2341.1 (95 % probability): <div><div>(a)</div><div><i>Repeatability</i> — Duplicate softening point results obtained by the same operator should not be considered suspect unless they differ by more than 1.5 °C.</div></div> <div><div>(b)</div><div><i>Reproducibility</i> — Results submitted by each of two laboratories should not be considered suspect unless the two results differ by more than 2.0 °C.</div></div>
Cl 13.1.1	Delete clause.
Cl 13.1.1.1	Delete clause.
Cl 13.1.1.2	Delete clause.
Cl 13.1.2	Delete clause.
Cl 13.1.2.1	Delete clause.
Cl 13.1.2.2	Delete clause.
Cl 13.1.3	Delete clause.
Cl 13.1.4	Delete clause.
Cl 13.2	Delete clause and <i>replace</i> with the following: The following criteria should be used for determining the acceptability of results for polymer modified binder (PMB) samples, as specified in AS/NZS 2341.1 (95 % probability): <div><div>(a)</div><div><i>Repeatability</i> — Duplicate softening point results obtained by the same operator should not be considered suspect unless the difference between them is more than the greater of 1.5 °C or 3 % of their mean.</div></div> <div><div>(b)</div><div><i>Reproducibility</i> — Results submitted by each of two laboratories should not be considered suspect unless the difference between them is more than the greater of 2.0 °C or 12 % of their mean.</div></div>
Cl 13.3	Delete clause.
Cl 13.4	Delete clause.
Tbl 1	Delete table.
Tbl 2	Delete table.

Standards Australia

Standards Australia develops Australian Standards® and other documents of public benefit and national interest. These Standards are developed through an open process of consultation and consensus, in which all interested parties are invited to participate. Through a Memorandum of Understanding with the Commonwealth Government, Standards Australia is recognized as Australia's peak non-government national standards body.

For further information visit www.standards.org.au

Australian Standards®

Committees of experts from industry, governments, consumers and other relevant sectors prepare Australian Standards. The requirements or recommendations contained in published Standards are a consensus of the views of representative interests and also take account of comments received from other sources. They reflect the latest scientific and industry experience. Australian Standards are kept under continuous review after publication and are updated regularly to take account of changing technology.

International Involvement

Standards Australia is responsible for ensuring the Australian viewpoint is considered in the formulation of International Standards and that the latest international experience is incorporated in national Standards. This role is vital in assisting local industry to compete in international markets. Standards Australia represents Australia at both the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

For information regarding the development of Standards contact:
Standards Australia Limited
GPO Box 476
Sydney NSW 2001
Phone: 02 9237 6000
Email: mail@standards.org.au
www.standards.org.au



ISBN 978 1 76072 818 2

This page has been left intentionally blank.