

BS ISO 3324-2:2013



BSI Standards Publication

Aircraft tyres and rims

Part 2: Test methods for tyres

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

National foreword

This British Standard is the UK implementation of ISO 3324-2:2013. It supersedes BS 3M 45-2:1998 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ACE/1, International and European Aerospace Policy and Processes.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013. Published by BSI Standards Limited 2013

ISBN 978 0 580 70874 9

ICS 49.035; 83.160.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2013.

Amendments issued since publication

Date	Text affected
------	---------------

INTERNATIONAL STANDARD

BS ISO 3324-2:2013

ISO
3324-2

Third edition
2013-07-01

Aircraft tyres and rims — Part 2: Test methods for tyres

*Pneumatiques et jantes pour aéronefs —
Partie 2: Méthodes d'essai des pneumatiques*



Reference number
ISO 3324-2:2013(E)
Documents
Document Sharing Hub
© ISO 2013



COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	1
5 Tyre preparation/break-in	2
5.1 Tyre conditioning	2
5.2 Tyre inflation and ambient temperature	2
5.3 Break-in procedure: static	2
5.4 Break-in procedure: dynamic or alternate static testing	2
6 Static tests	2
6.1 Burst pressure (pressure proof test)	2
6.2 Bead seating pressure	2
6.3 Air retention: tubeless tyres	3
6.4 Tyre dimensions	3
6.5 Load-deflection curves	4
7 Dynamometer tests	6
7.1 General	6
7.2 Pressure correction	6
7.3 Dynamometer test procedure: low-speed tyres for which no load/speed/time/distance data are specified	7
7.4 Dynamometer test procedure: low- and high-speed tyres	7
7.5 Dynamometer test speeds	12
7.6 Dynamometer test procedure: high-speed tyres with sortie load/speed/time/distance data	13
Bibliography	15

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 31, *Tyres, rims and valves*, Subcommittee SC 8, *Aircraft tyres and rims*.

This third edition cancels and replaces the second edition (ISO 3324-2:1998), which has been technically revised.

ISO 3324 consists of the following parts, under the general title *Aircraft tyres and rims*:

- *Part 1: Specifications*
- *Part 2: Test methods for tyres*

Aircraft tyres and rims —

Part 2: Test methods for tyres

1 Scope

This part of ISO 3324 specifies test methods for new and retreaded aircraft tyres in the following categories:

- a) low-speed tyres: for ground speeds up to and including 104 kn (120 mile/h);
- b) high-speed tyres: for ground speeds above 104 kn (120 mile/h).

NOTE 1 kn = 1,852 km/h = 1,1508 mile/h.

2 Normative references

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

ISO 4223-1, *Definitions of some terms used in the tyre industry — Part 1: Pneumatic tyres*

3 Terms and definitions

For the purposes of this document, the definitions given in ISO 4223-1 apply.

4 Symbols

L_0	tyre load at start of take-off (greater than or equal to the rated load), in pounds
L'_0	tyre load at start of take-off for the operational load curve, in pounds
L_1	test tyre load at rotation, in pounds
L'_1	operational tyre load at rotation, in pounds
L_2	tyre load at lift-off, in pounds
S_0	speed at start of take-off, in miles per hour
S_1	speed at rotation, in miles per hour
S_2	tyre speed at lift-off, in miles per hour (greater than or equal to the rated speed)
T_0	time at start of take-off, in seconds
T_1	time at constant test load, in seconds
T_2	time to rotation, in seconds
T_3	time to lift-off, in seconds

5 Tyre preparation/break-in

5.1 Tyre conditioning

Before break-in of the tyre, it shall be conditioned by mounting on its design rim and inflating it to the rated inflation pressure. It shall be allowed to remain in this condition for 12 h at an ambient temperature between 16 °C and 37,8 °C.

5.2 Tyre inflation and ambient temperature

After the tyre has been stretched for 12 h on the design rim as indicated in [5.1](#), the tyre pressure shall be adjusted to the rated pneumatic inflation pressure and checked with a gauge which has been calibrated to within one percent. All tests shall be carried out at ambient temperatures between 16 °C and 37,8 °C.

5.3 Break-in procedure: static

This method of tyre break-in is to prepare the test tyre by inflating it to rated inflation pressure and loading the tyre under direct vertical load against a hard flat unyielding surface until the tyre deflection measures 50 % of the section height. The load is then removed. This break-in is to be carried out at two locations equally spaced around the tyre, with the centreline of the contact patch being located at 180° intervals around the circumference of the tyre.

5.4 Break-in procedure: dynamic or alternate static testing

This method of tyre break-in is to prepare the test tyre by inflating it to rated inflation pressure corrected for flywheel curvature, then performing five rated load take-off cycles with a load-speed-time curve representative of the applicable aircraft.

6 Static tests

6.1 Burst pressure (pressure proof test)

Mount the tyre on a test wheel of adequate strength, and inflate it hydraulically at a slow rate to the minimum specified burst pressure.

Maintain the tyre at this pressure for 3 s without failure.

Continue inflating the tyre at a slow rate until burst.

Burst pressure tests of tubeless tyres may be conducted with an inner tube fitted.

6.2 Bead seating pressure

Determine the bead seating pressure by the following method:

The contact area of the wheel is cleaned to expose the metal surface.

Three pieces of shim copper or steel, 120° from each other, are fixed to one tyre bead. The shims are held in place with light gauge non-conducting adhesive tape (see [Figure 1](#)). The tape insulates the shims from the top of the rim flange.

This procedure calls for the use of a battery, fitted with two leads, one of which is a fixed lead containing a lamp or ohmmeter; the other lead is used as the probe lead to make contact with the three shims in turn.

The tyre is inflated in increments, and after each increment, the probe lead is placed on the shims in turn. When the lamp lights or the ohmmeter reading is zero, at all three shim locations, the bead is considered to be fully seated on the wheel at the recorded inflation pressure, and that pressure is considered to be the bead seating pressure.