

BS ISO 28279:2010



BSI Standards Publication

Sintered metal materials — Determination of the level of cleanliness of powder- metallurgy parts

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™



National foreword

This British Standard is the UK implementation of ISO 28279:2010.

The UK participation in its preparation was entrusted to Technical Committee ISE/65, Sintered metal components.

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.

© BSI 2010

ISBN 978 0 580 61820 8

ICS 77.160

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 October 2010.

Amendments issued since publication

Date	Text affected
<hr/>	

INTERNATIONAL STANDARD

BS ISO 28279:2010

ISO
28279

First edition
2010-10-01

Sintered metal materials — Determination of the level of cleanliness of powder- metallurgy parts

*Matériaux métalliques frittés — Détermination du niveau de propreté
des pièces en poudres métalliques*



Reference number
ISO 28279:2010(E)

© ISO 2010

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing 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 Symbols and units.....	1
3 Principle	1
4 Apparatus.....	1
5 Procedure.....	2
6 Expressions of results.....	4
7 Test report.....	4

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 28279 was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*, Subcommittee SC 3, *Sampling and testing methods for sintered metal materials (excluding hardmetals)*.

Sintered metal materials — Determination of the level of cleanliness of powder-metallurgy parts

1 Scope

This International Standard specifies the determination of the amount and nature of the surface contamination of powder-metallurgy (PM) parts (i.e. the level of cleanliness of PM parts).

2 Symbols and units

For the purposes of this document, the following symbols and units apply.

Symbol	Explanation	Unit
C	Amount of contaminant.	mg/part
m ₁	Mass of the as-received, dried 5 µm filter (4.4).	g
m ₂	Mass of the dried 5 µm filter (4.4) plus the contaminants.	g
N	Number of parts taken for testing.	—

3 Principle

PM parts are pressure-rinsed with a filtered solvent that is subsequently re-filtered in order to capture surface contaminants. The filtered residue is weighed and the contaminant particles are examined with a magnifying glass or stereomicroscope in order to determine their nature.

4 Apparatus

4.1 Filter funnel.

4.2 Filtering flask, with a minimum volume of 2 L.

4.3 Vacuum pump.

4.4 Filter, 5 µm, made of polyester (preferred material) or polyamide of diameter 20 mm to 50 mm (type of filter depending on the solvent).

4.5 Filter, maximum 1 µm, made of polyester (preferred material), polyamide or cellulose (type of filter material depending on the solvent) of diameter 20 mm to 50 mm.

4.6 Analytical balance, of capacity at least 20 g and 0,000 1 g accuracy.

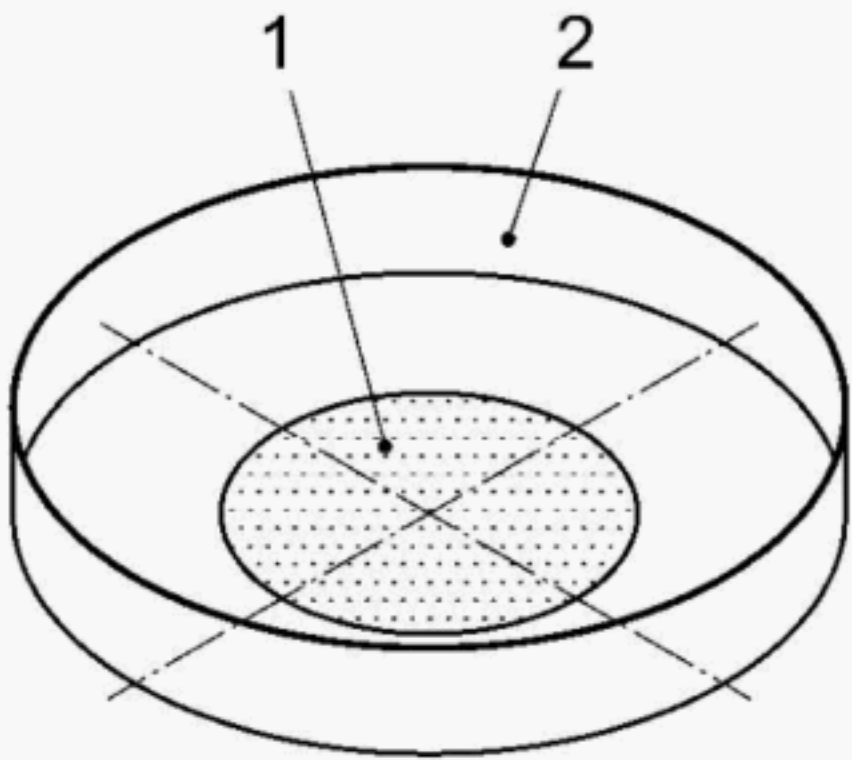
4.7 Petri-dish set, (only the bottom portion).

- 4.8 **Drying oven**, with a capability of at least 100 °C and 10 °C accuracy.
- 4.9 **Desiccator**.
- 4.10 **Pressure gun for liquids**.
- 4.11 **Solvent (white spirit)**.
- 4.12 **Stereomicroscope** (at least ×10 magnification) or **microscope**.
- 4.13 **Glass microscope slides**.
- 4.14 **Stainless-steel tongs**, with flat tips.
- 4.15 **Gloves**, made of latex or another type of plastic depending on the solvent used. The gloves should be used in order to prevent contamination during handling.

5 Procedure

5.1 Place the 5 µm filter (4.4) on the Petri dish (see Figure 1), and dry it in an oven (4.8) at 100 °C for at least 30 min.

The recommended filter mesh is 5 µm and other mesh should be agreed between the user and supplier.

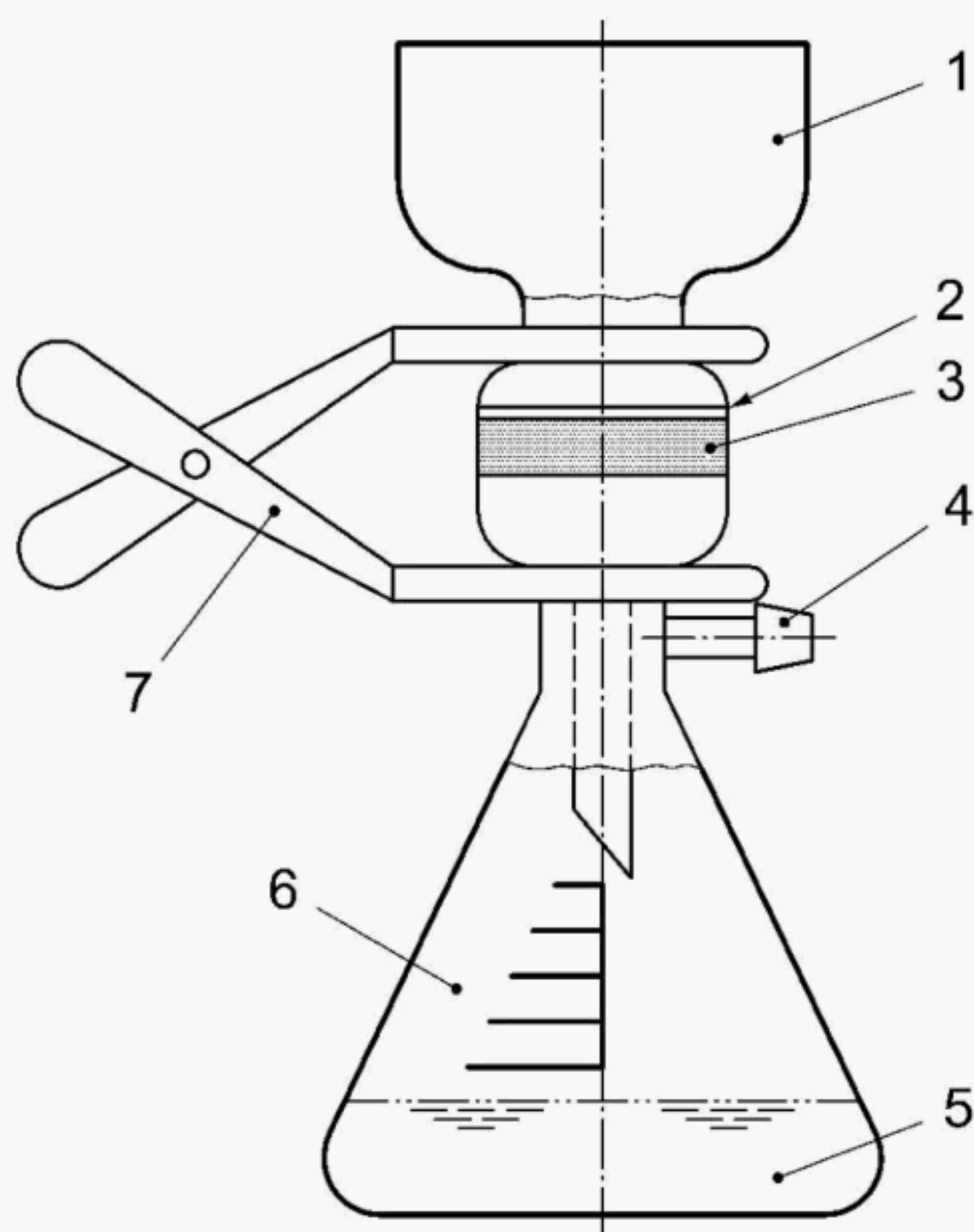


- Key
- 1 filter
 - 2 Petri dish

Figure 1 — Filter ready to be dried

- 5.2 Transfer the Petri dish and filter to the desiccator (4.9), and cool it to room temperature.
- 5.3 Weigh the dried filter to the nearest 0,000 1 g with an analytical balance (4.6), and record the mass m_1 .
- 5.4 Filter at least 2 L of white spirit solvent by using the filtering flask and the vacuum pump (see Figure 2), with the maximum 1 µm filter (4.5) (see Figure 2). Keep this filtered solvent in a clean glass bottle previously cleaned with pure solvent.

The recommended solvent is white spirit and any other solvent should be agreed between the user and supplier.



Key

- | | | | |
|---|------------------------|---|------------------|
| 1 | filter funnel | 5 | filtered solvent |
| 2 | filter | 6 | filtering flask |
| 3 | porous plate | 7 | clips |
| 4 | vacuum-pump connection | | |

Figure 2 — System for cleaning the solvent and/or filtering the contaminants

5.5 Take a number of parts so as to have a total surface area of at least 1 000 cm², and note the total number of parts N. Take care not to contaminate the PM parts during handling.

In case of difficulty in reaching 1 000 cm² of surface because the part is too big or too small, the surface area should be agreed between the user and supplier.

5.6 Rinse the parts with the pressure gun (4.10) by using 1 L of filtered solvent, at a pressure of (200 ± 50) kPa, and save the solvent after rinsing. Ensure that the solvent wets all surfaces of the PM parts during this operation.

NOTE Both parties can decide if a pressure gun should be used. In some cases, an extraction technique based on ultrasound might be suitable.

5.7 Filter the contaminated solvent by using the glass filtering flask (4.2) and the vacuum pump (4.3) using the same system as shown in Figure 2, with the previously dried and weighed 5 µm filter (4.4). The filter now has collected the contaminants from the PM parts.

5.8 Using the same vacuum system, rinse the residues and the 5 µm filter (4.4) with 200 ml of clean, filtered solvent (4.11) in order to remove any trapped oil.

5.9 Place the filter with residues on the Petri dish (4.7) and dry it in the oven (4.8) at 100 °C for at least 30 min (same system as shown in Figure 1). Then transfer the Petri dish and filter to the desiccator (4.9), and cool to room temperature.

5.10 Weigh the filter with residues to the nearest 0,000 1 g in an analytical balance, and record the mass m_2 .

5.11 Place the filter with residues between two glass microscope slides (4.13) (see Figure 3), and visualize the particles by means of the stereomicroscope with at least $\times 10$ magnification power or a microscope (4.12). Note the nature of the contaminants and their size taken at maximum length/diameter.

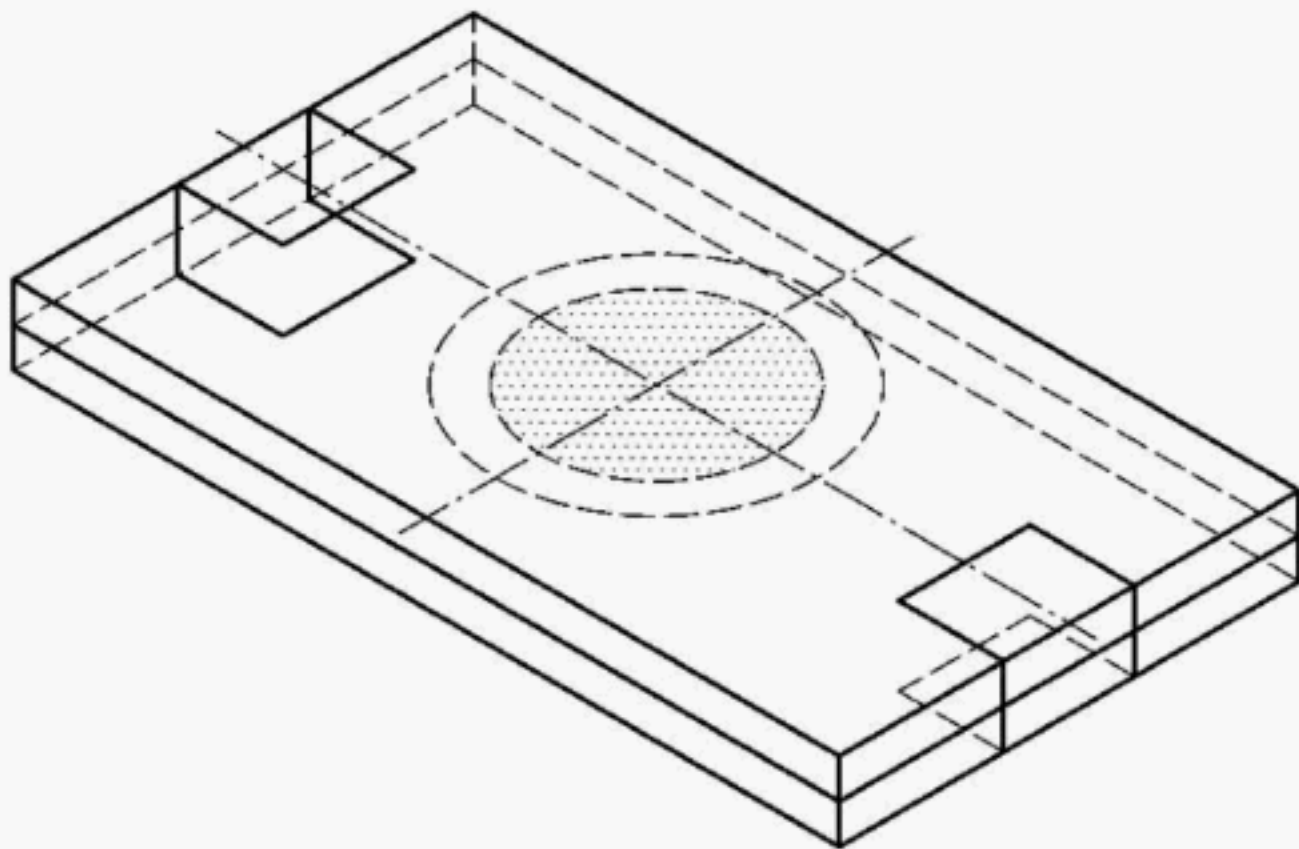


Figure 3 — Filter ready to be observed by means of a stereomicroscope or microscope

6 Expressions of results

6.1 The amount of contaminant, C , in milligrams per part, is calculated as follows:

$$C = \frac{m_2 - m_1}{N} \times 1\,000$$

6.2 The nature of the contamination is expressed as the maximum size of each contaminant particle, in micrometres (μm), and its nature.

7 Test report

The test report should include the following information:

- a reference to this International Standard; i.e. ISO 28279:2010;
- the name or designation of the parts tested;
- the amount of contaminant, C , in milligrams per part;
- the size of the maximum particle of each type of contaminant observed, in micrometres;
- the nature of the contaminant.

This International Standard specifies a unique way for determining the contamination. Any variation regarding the filter mesh, the type of solvent, or the extraction method, should be agreed between the two parties. If the application of the part is in vacuum or under a pressure exceeding 10 hPa, an ultrasonic extraction technique can be used, except for material that can be chemically attacked by ultrasound (such as aluminium). In this case, both parties should agree to use the same type of ultrasonic device, and they should agree on the frequency of the ultrasound and the extraction time.

ICS 77.160

Price based on 4 pages

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services.

It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers Members an individual updating service called PLUS which ensures

that subscribers automatically receive the latest editions of standards.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001

Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website www.bsigroup.com/shop. In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

Email: orders@bsigroup.com

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.

Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005

Email: knowledgecentre@bsigroup.com

Various BSI electronic information services are also available which

give details on all its products and services.

Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048

Email: info@bsigroup.com

BSI Subscribing Members are kept up to date with standards developments and receive substantial discounts on the purchase price

of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001

Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at www.bsigroup.com/BSOL

Further information about BSI is available on the BSI website at www.bsigroup.com/standards

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies.

Ex-

cept as permitted under the Copyright, Designs and Patents Act 1988 no ex-

tract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. This does not preclude the free use, in the course of implementing the standard of necessary details such as

symbols, and size, type or grade designations. If these details are to be used

for any other purpose than implementation then the prior written permission

of BSI must be obtained. Details and advice can be obtained from the Copy-

right & Licensing Manager.

Tel: +44 (0)20 8996 7070

Email: copyright@bsigroup.com

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™

标准分享网 www.bzfxw.com 免费下载