

**BRITISH STANDARD**

**BS EN ISO  
8502-3:2000  
BS 7079-B3:1993**

*Incorporating  
Amendment No. 1 to  
BS 7079-B3:1993  
(renumbers the BS as  
BS EN ISO 8502-3:2000)*

# **Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness —**

**Part 3: Assessment of dust on steel  
surfaces prepared for painting  
(pressure-sensitive tape method)**

The European Standard EN ISO 8502-3:2000 has the status of a British Standard.

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The preparation of this British Standard was entrusted by the Surface Treatments and Coatings Standards Policy Committee (STC/-) to Technical Committee STC/21, upon which the following bodies were represented:

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 British Chemical Engineering Contractors Association  
 British Constructional Steelwork Association Ltd.  
 British Gas plc  
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This British Standard, having been prepared under the direction of the Surface Treatments and Coatings Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on  
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# Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Introduction	1
1 Scope	1
2 Normative references	2
3 Definition	2
4 Principle	2
5 Apparatus and materials	2
6 Procedure	2
7 Test report	4
Annex A (informative) Spring-loaded roller	5
Figure 1 — Pictorial references corresponding to dust quantity ratings 1, 2, 3, 4 and 5	3
Figure A.1 — Sectional side view of roller	6
Figure A.2 — Plan view of adjustable-height shaft and top plug	7
Figure A.3 — Sectional front view of lower part of roller	7
Figure A.4 — Calibration at the 4 kg and 5 kg graduations	8
Table 1 — Dust size classes	4

## National foreword

This British Standard is the English language version of EN ISO 8502-3:2000. It is dual numbered as BS 7079-B4:1993.

### Cross references

The British Standards which implement International or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index" or by using the "Find" facility of the BSI Standards Electronic Catalogue.

The Technical Committee has reviewed the provisions of IEC 454-2:1974, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. IEC 454-2:1974 is related to BS 3924:1978.

Further information on the ISO 8501, ISO 8502, ISO 8503 and ISO 8504 series of standards is given in BS 7079 *Preparation of steel substrates before application of paints and related products — Part 0: Introduction*.

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, the EN foreword page, pages 1 to 8, an inside back cover and a back cover.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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EN ISO 8502-3

May 1999

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English version

Preparation of steel substrates before application of paint and related products — Tests for the assessment of surface cleanliness — Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)

(ISO 8502-3:1992)

Préparation des subjectiles d'acier avant application de peintures et de produits assimilés — Essais pour apprécier la propreté d'une surface —  
Partie 3: Evaluation de la poussière sur les surfaces d'acier préparées pour la mise en peinture (méthode du ruban adhésif sensible à la pression)  
(ISO 8502-3:1992)

Vorbereitung von Stahloberflächen vor dem Auftragen von Beschichtungsstoffen — Prüfungen zum Beurteilen der Oberflächenreinheit —  
Teil 3: Beurteilung von Staub auf für das Beschichten vorbereiteten Stahloberflächen (Klebeband-Verfahren)  
(ISO 8502-3:1992)

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Ref. No. EN ISO 8502-3:1999 E

## **Foreword**

The text of the International Standard from Technical Committee ISO/TC 35, Paints and varnishes, of the International Organization for Standardization (ISO) has been taken over as a European Standard by Technical Committee CEN/TC 139, Paints and varnishes, the Secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 1999, and conflicting national standards shall be withdrawn at the latest by November 1999. According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

The performance of protective coatings of paint and related products applied to steel is significantly affected by the state of the steel surface immediately prior to painting. The principal factors that are known to influence this performance are:

- a) the presence of rust and mill scale;
- b) the presence of surface contaminants, including salts, dust, oils and greases;
- c) the surface profile.

International Standards ISO 8501, ISO 8502 and ISO 8503 have been prepared to provide methods of assessing these factors, while ISO 8504 provides guidance on the preparation methods that are available for cleaning steel substrates, indicating the capabilities of each in attaining specified levels of cleanliness.

These International Standards do not contain recommendations for the protective coating systems to be applied to the steel surface. Neither do they contain recommendations for the surface quality requirements for specific situations even though surface quality can have a direct influence on the choice of protective coating to be applied and on its performance. Such recommendations are found in other documents such as national standards and codes of practice. It will be necessary for the users of these International Standards to ensure that the qualities specified are:

- compatible and appropriate both for the environmental conditions to which the steel will be exposed and for the protective coating system to be used;
- within the capability of the cleaning procedure specified.

The four International Standards referred to above deal with the following aspects of preparation of steel substrates:

- ISO 8501 — Visual assessment of surface cleanliness;
- ISO 8502 — Tests for the assessment of surface cleanliness;
- ISO 8503 — Surface roughness characteristics of blast-cleaned steel substrates;
- ISO 8504 — Surface preparation methods.

Each of these International Standards is in turn divided into separate parts.

This part of ISO 8502 describes a procedure for the assessment, using a pressure-sensitive tape method, of the quantity and the particle size of dust on steel surfaces prepared for painting.

In the painting schedule requirements of contractual documents giving details of surface preparation by blast-cleaning, it is normally specified that all surfaces shall be free from surface contamination including oil, grease, dirt, dust and water-soluble salts.

Dust on blast-cleaned steel surfaces may reduce the adhesion of subsequently applied organic coatings and, by absorbing moisture, may promote the corrosion of the blast-cleaned steel surfaces. Accumulation of dust more naturally occurs on horizontal surfaces, the interior of pipes, and in structural cavities. Special inspection should be carried out to ensure that such areas are adequately cleaned and adequately free from dust before painting.

Because of subjective factors involved in the test procedure, the test does not allow the precise determination of dust retained on blast-cleaned steel surfaces. Nevertheless, when carried out by experienced operators, and especially when used to compare the performance of surfaces under test with agreed standard specimens, it gives very useful information.

There are many possible variables in the conditions at sites where tests may be required to be carried out. Agreements made between interested parties where appropriate should include the number or frequency of tests, the test locations, and the dates and times when the tests are to be carried out.

## 1 Scope

1.1 This part of ISO 8502 describes a method for the assessment of dust remaining on cleaned steel surfaces prepared for painting. It provides pictorial ratings for the assessment of the average quantity of dust. It also provides descriptive classes for the assessment of the average size of the dust particles.

NOTE 1 The quantity ratings and size classes referred to in this part of ISO 8502 are derived from ISO 4628-1:1982, *Paints and varnishes — Evaluation of degradation of paint coatings — Designation of intensity, quantity and size of common types of defect — Part 1: General principles and rating schemes*.

1.2 The method may be carried out either

- a) as a "pass/fail" test by assessing the quantity of dust present on a test surface, and the average dust particle size, in comparison with specific limits;
- or
- b) to provide a permanent record of the dust present on a surface by mounting the tapes used to carry out the tests on tiles, cards or paper, of an appropriate contrasting colour.

**1.3** This method is suitable for the assessment of dust retained, after cleaning, on a steel surface which corresponded before cleaning to rust grade A, B or C as defined in ISO 8501-1. Because of the limited elasticity of adhesive tape, it is not possible for the tape to penetrate into the deep pits present in cleaned steel that originally corresponded to rust grade D.

**1.4** While a test procedure in which pressure is applied to a tape using the thumb is subjective, it is usually adequate, especially for use in situations where surfaces free from dust are required. In cases of dispute, except when rust grade C or D is involved, pressure may be applied to the back of the adhesive tape using a spring-loaded roller.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8502. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8502 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8501-1:1988, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness —*

*Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.*

IEC 454-2:1974, *Specifications for pressure-sensitive adhesive tapes for electrical purposes — Part 2: Methods of test.*

## 3 Definition

For the purposes of this part of ISO 8502, the following definition applies.

### 3.1 dust

loose particulate matter present on a steel surface prepared for painting, arising from blast-cleaning or other surface preparation processes, or resulting from the action of the environment

## 4 Principle

A pressure-sensitive adhesive tape is pressed on to the steel surface prepared for painting. The tape, with the dust adhering to it, is then removed and placed on a display board of a colour which contrasts to that of the dust, and is examined visually. The quantity of dust adhering to the tape and the dust particle size are then estimated.

## 5 Apparatus and materials

**5.1 Adhesive tape**, consisting of rolls of virtually colourless, transparent, self-adhesive, pressure-sensitive tape of width 25 mm, having an adhesion peel strength of at least 190 N per metre width when measured in accordance with the 180° peel test in IEC 454-2.

NOTE 2 This peel test calls for a 180° peel from steel backing at a peel rate of  $(300 \pm 30)$  mm/min.

**5.2 Display board**, of colour contrasting to that of the dust, for use as a background, e.g. of glass or black or white glazed tiles, cards or paper.

**5.3 Spring-loaded roller**, so designed that it is capable of applying a load of 39,2 N or 49,0 N or an intermediate load. (See Annex A.)

NOTE 3 The roller is calibrated using weightpieces of mass 4 kg and 5 kg. At the 4 kg calibration point, the force exerted by the roller is 39,2 N, and at the 5 kg calibration point it is 49,0 N.

**5.4 Hand lens**, capable of magnification  $\times 10$ .

## 6 Procedure

**6.1** At the beginning of each series of tests, remove and discard the first three turns of tape from the roll and then remove a piece about 200 mm long.

**6.2** Touching the adhesive side of the tape only at the ends, press about 150 mm of the freshly exposed tape firmly on to the surface under test. With due regard to subclause 1.4, adopt one of the following alternative methods given in a) and b).

a) Place the thumb across one end of the tape and move the thumb, while maintaining a firm pressure, at a constant speed along the tape three times in each direction, so that each stroke takes between 5 and 6 seconds. Remove the tape from the test surface, place it on an appropriate display board (5.2) and cause it to adhere to the board by rubbing with the thumb.

b) Apply the calibrated spring-loaded roller (5.3) centrally across one end of the tape and move the roller, while maintaining a downward load between 39,2 N and 49,0 N (see note 3), at a constant speed along the tape three times in each direction, so that each stroke takes between 5 and 6 seconds. Remove the tape from the test surface, place it on an appropriate display board (5.2) and cause it to adhere to the board by rubbing with the thumb.

**6.3** Assess the quantity of dust on the tape by comparing visually an area of the tape with equivalent-sized areas of the pictorial references shown in Figure 1. Record the rating corresponding to the reference that is the closest match.

NOTE 4 The use of intermediate half-steps is permissible if required to give a more detailed report.



Report any overall discoloration as quantity rating 5, size class 1.

NOTE 5 It is not unusual, after carrying out this test, to find that the tape displays an overall discoloration, usually reddish-brown or black, sometimes with the presence of discrete visible particles, depending on the type of abrasive used. The discoloration is caused by microscopic dust from the test surface that can cause serious interference with paint adhesion.

6.4 Assess the predominating dust particle size on the adhesive tape by reference to Table 1 which defines six dust particle size classes, designated 0, 1, 2, 3, 4 and 5.

NOTE 6 The use of intermediate half-steps is permissible if required to give a more detailed report.

Report any overall discoloration as size class 1 (see note 5).

NOTE 7 Microscopic dust discoloration usually consists of particles less than 50  $\mu\text{m}$  in diameter.

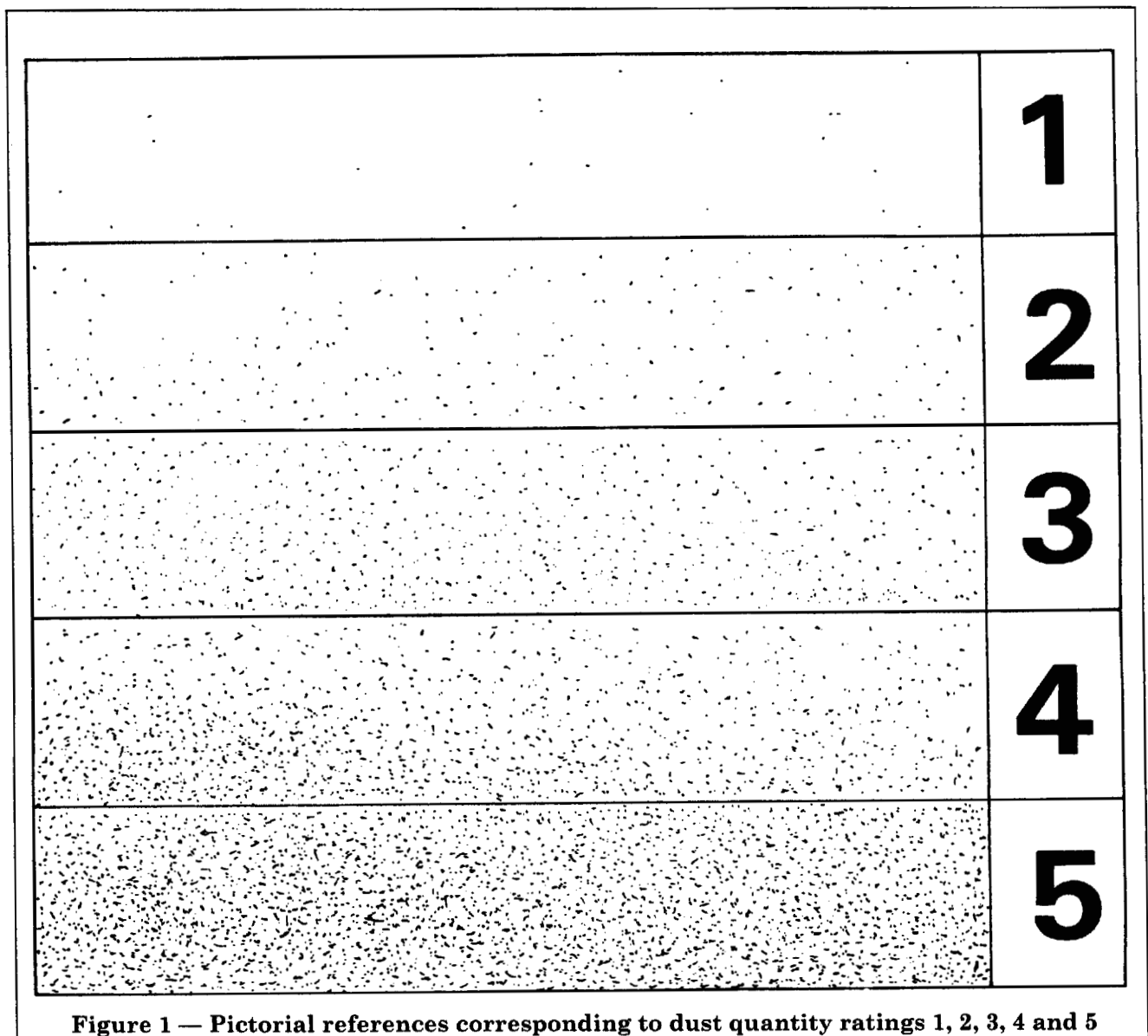


Figure 1 — Pictorial references corresponding to dust quantity ratings 1, 2, 3, 4 and 5

Table 1 — Dust size classes

Class	Description of dust particles
0	Particles not visible under 10 × magnification
1	Particles visible under 10 × magnification but not with normal or corrected vision
2	(usually particles less than 50 µm in diameter)
3	Particles just visible with normal or corrected vision (usually particles between 50 µm and 100 µm in diameter)
4	Particles clearly visible with normal or corrected vision (particles up to 0,5 mm in diameter)
5	Particles between 0,5 mm and 2,5 mm in diameter
	Particles larger than 2,5 mm in diameter

**6.5** Carry out a sufficient number of tests to characterize the surface under test.

For every surface of one particular type and aspect, carry out not less than three separate tests. If the results do not have a spread of one or less quantity rating, carry out at least two additional tests to establish the mean.

**6.6** After completing the test and before painting the steel surface, remove any tape or adhesive left on the test surface.

## 7 Test report

The test report shall contain at least the following information:

- a) all details necessary to identify the surface(s) tested;
- b) a reference to this part of ISO 8502 (i.e. ISO 8502-3);

c) all details necessary to identify the adhesive tape used;

d) all details necessary to identify the substrate used as a display background for the tape;

e) the nature of the area(s) of each surface tested, with reference to specific features, e.g. ledges, beams, web or flange faces, pockets formed from fabricated units and the attitude of the test area, e.g. vertical, horizontal upward-facing or horizontal downward-facing;

f) the dust quantity rating(s) and dust size class(es) for each surface examined (alternatively, for general steel construction work, the test tapes themselves may, if agreed between the interested parties, be kept as a record of the tests);

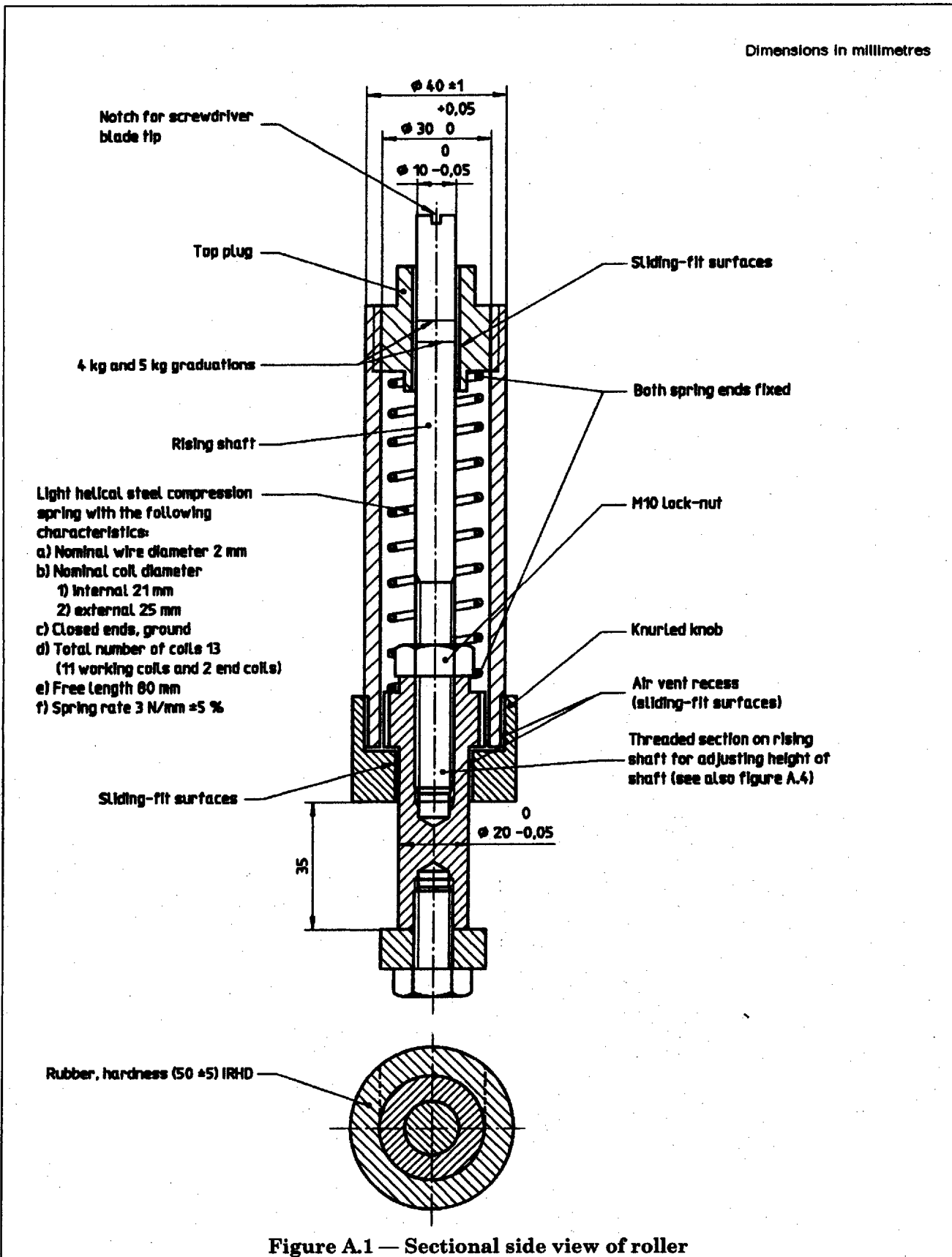
g) any deviation from the procedure described;

h) the date and, if applicable, the time of each test.

## **Annex A (informative)**

### **Spring-loaded roller**

This annex shows, by way of example only, the design of a roller that has been found suitable in use. For detailed sectional views, see Figure A.1, Figure A.2 and Figure A.3. Instructions for calibration are given in Figure A.4.



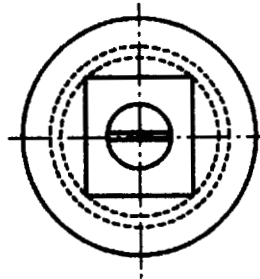


Figure A.2 — Plan view of adjustable-height shaft and top plug

Dimensions in millimetres

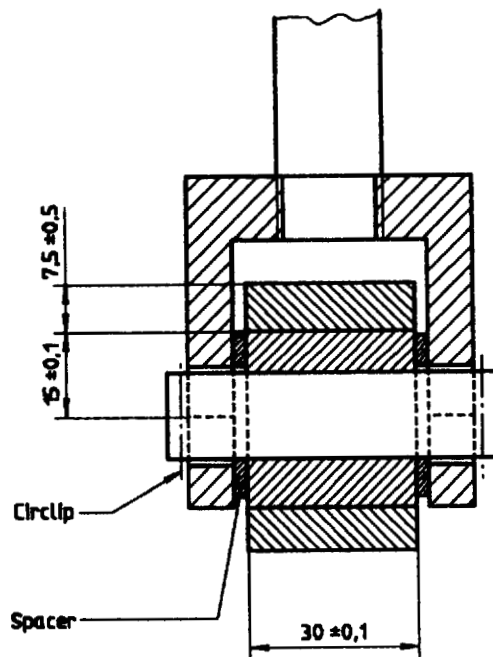
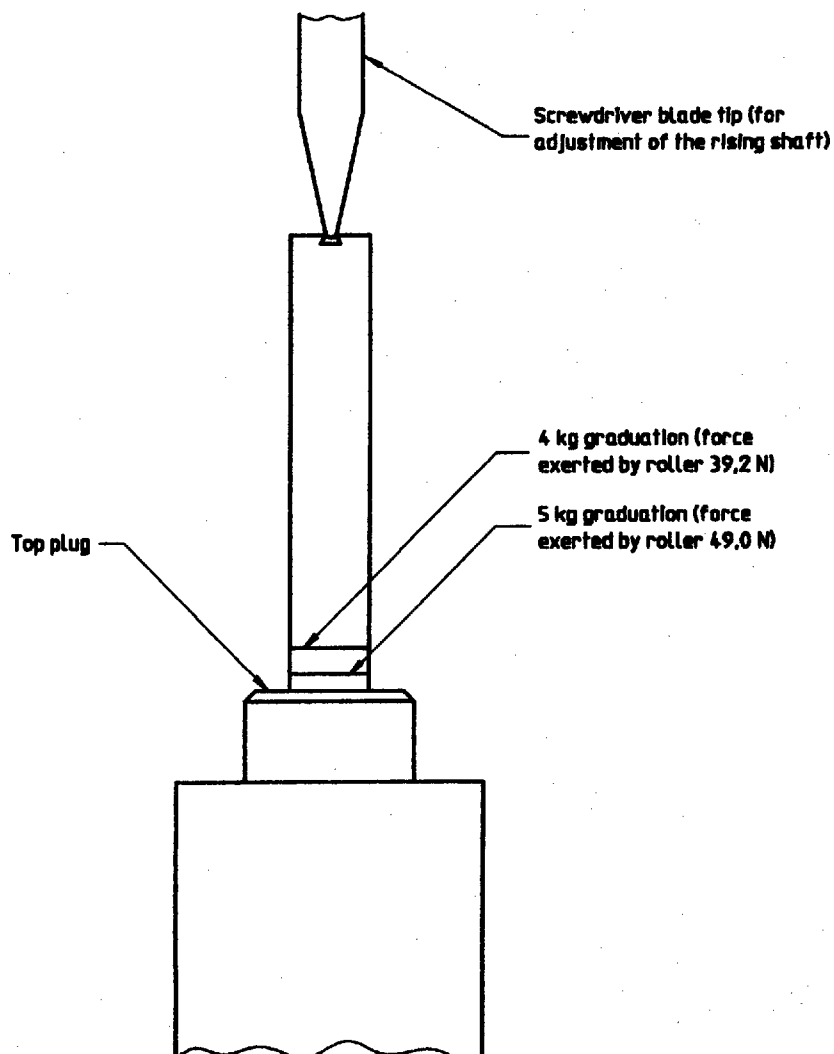


Figure A.3 — Sectional front view of lower part of roller



**NOTE** To set the applied roller pressure, hold the roller vertically by the casing and press the roller on to the pan of a suitable weighing scale so that the roller exerts a force equal to the weight of a 4 kg or 5 kg weightpiece, as required. Adjust the height of the rising shaft with a screwdriver so that the 4 kg or 5 kg graduation on the shaft is level with the top of the top plug. Set the position of the rising shaft by means of the lock-nut.

**Figure A.4 — Calibration at the 4 kg and 5 kg graduations**

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