
British Standard Methods of test for

Petroleum and its products

Part 0. General introduction

Méthodes d'essai pour le pétrole et les produits pétroliers
Partie 0. Introduction générale

Prüfmethoden für Erdöl und Erdölprodukte
Teil 0. Allgemeine Einführung

Foreword

BS 2000 comprises a series of test methods for petroleum and its products, published under the direction of the Petroleum Standards Committee as a result of an agreement between the British Standards Institution and the Institute of Petroleum (IP). The methods in question have all been previously published in 'IP Standards for Petroleum and its Products', and the Part numbers in BS 2000 are identical with the IP method numbers. Grateful acknowledgement is made to the IP for permission to publish the methods as British Standards and for the assistance received in preparing them for publication in this form.

Table 1 lists the first group of Parts to be published in BS 2000, the text being reproduced from the 1981 and 1982 editions of 'IP Standards : Part 1', as appropriate. Earlier editions of these methods were published under separate BS numbers, as indicated in table 1. Further Parts will be added to BS 2000 from time to time, as decisions are taken to accord BS status to other IP methods. The published Parts will be revised as necessary in line with any technical changes that may be made in subsequent editions of the corresponding IP methods.

Addenda 1 and 2 to Part 0 are published separately. Addendum 1 includes details of standard reagents and thermometers referred to in the test methods, with notes on care and use of liquid-in-glass thermometers, reproduced from appendix A of 'IP Standards : Part I'. Addendum 2 is reproduced from appendix E of 'IP Standards : Part I' and describes the significance and usage of IP precision data relating to the repeatability and reproducibility of petroleum test methods.

NOTE. The titles of the standards publications referred to in this Part of this British Standard (with the exception of those mentioned only in tables 1 and 2) are listed on the inside back cover.

1. Background to the project

1.1 For very many years, BSI and the Institute of Petroleum (IP) have collaborated in the drafting and publication of numerous test methods and measurement procedures developed within the petroleum industry. These standard methods and procedures are used for either or both of two main purposes: first, to assist quality control within the production and refinery sector of the industry; and secondly, to characterize the industry's products. Methods in the first category may be mainly of internal interest to the industry, but may also figure prominently in custody transfer arrangements, royalty calculations and international trade. Methods in the second category may be of interest to a wide range of user industries, in commercial and trading operations at national or international level, and in certain cases also to the general public.

1.2 The Institute of Petroleum has traditionally confined its attention to methods in the following categories:

- (a) analysis and testing, Part I (2 volumes) of 'IP Standards';
- (b) rating of fuels (including engine tests), Part II of 'IP Standards';
- (c) sampling, Part IV of 'IP Standards'.

Part III of 'IP Standards' was formerly concerned with engine and axle tests for automotive lubricants, but during the 1970's responsibility for drafting and publishing these methods was passed to the Coordinating European Council for the Development of Performance Tests for Fuels and Engine Lubricants (CEC), for which the member companies of the IP provide the UK input and the Secretariat.

1.3 In contrast to the IP, the primary BSI interest in

relation to petroleum test methods has been in those required for reference in product specifications, the best known of which are:

- BS 135, 458, 805 Specifications for benzene, xylenes and toluenes
- BS 148 Insulating oil for transformers and switchgear
- BS 489 Steam turbine oils
- BS 2626 Lubricating oils for refrigerant compressors
- BS 2869 Petroleum fuels for oil engines and burners
- BS 3690 Bitumens for road purposes
- BS 4040 Specification for petrol (gasoline) for motor vehicles
- BS 4250 Commercial butane and propane
- BS 4475 Straight mineral lubricating oils
- BS 5362 Specification for rolling bearing greases

Each of these specifications requires a number of standard methods to define the composition, performance and other characteristics of the product. In the past these methods have been published by BSI in one of the following three ways:

- (a) as appendices to a product specification, especially in cases where the method is only relevant to one group of products;
- (b) as part of a collection of methods of interest to a particular sector of industry;
- (c) as separate British Standards.

1.4 IP standard methods are drafted, under the authority of its Standardization Committee, by Sub-committees and Panels of experts drawn not only from the industry but from leading user bodies such as the Ministry of Defence and London Transport. Those in Part I of 'IP Standards' are republished annually, with technical or editorial revisions as required, and they can then be taken to represent the technical consensus of the whole industry. When considered for adoption by a BSI committee responsible for a product specification, they are therefore usually accepted without question as representing the latest thinking on the methods under discussion.

1.5 In these circumstances, it is both more convenient and less costly for the IP text of a method to be reproduced without deviation as a British Standard than for it to be re-edited and re-set. It has therefore become routine practice, in accordance with an agreement between the two organizations, for BSI to reproduce in facsimile the IP methods for which British Standard status is required (with due acknowledgement on the back page and in the foreword), with additional notes or appendices where appropriate to provide any further information considered necessary in a British Standard (including, for example, appropriate cross-references to other British Standards and notes on departures from standard BSI usage in relation to units and symbols).

2. Proposals for a more comprehensive approach

2.1 On the initiative of the IP, a series of informal meetings between the two organizations took place from 1977 to 1980 to consider various possibilities for a more comprehensive endorsement of the IP standard methods as British Standards. The IP view was that such an endorsement would confer an enhanced national status on methods that had the full backing of the petroleum industry, and thus make their acceptance more likely at the international level. However, it was not possible to reach agreement on wholesale endorsement by BSI of 'IP Standards : Part I', mainly for the following reasons.

(a) The IP wished to continue to issue this 2-volume book as an annual publication and was bound by contract to continue with the present form of publication for several years. In these circumstances, the parallel publication of all the methods as separate British Standards, in accordance with BSI practice, was considered to be an undesirable duplication which would prove uneconomic for one or both parties and would lead to the same problems of minor differences in presentation and out of date British Standard versions as had arisen with the previous piecemeal system of publication.

(b) The BSI Charter required (according to the accepted interpretation) that BSI should have ultimate control over the publication (and sale) of any document having the status of a British Standard. This prevented endorsement, without some form of re-publication, of standards published by another organization such as the IP, or by a commercial firm.

2.2 The discussion was therefore continued on a more limited basis, aimed at improving aspects of the existing arrangements which were recognized as being unsatisfactory. This led to agreement on the following scheme.

- (a) BSI to allocate a single BS number for IP methods published by BSI. The number BS 2000 was subsequently allocated for this purpose.
- (b) Each IP method to be published as a Part of BS 2000, using the corresponding IP number to identify the Part.
- (c) IP to review all the published methods and to list those proposed as suitable for BS status, in the form of a programme to be handled in the course of a few years, taking account of revision work already planned, international discussions on petroleum test methods, and the BSI staff resources that could be made available.
- (d) BSI to progress rapidly the conversion of the existing IP-based British Standards to the new numbering system, taking into account the latest revisions in the IP texts.
- (e) BSI to establish a Technical Committee under the authority of the Petroleum Standards Committee to be responsible for general test methods work on petroleum products; this committee to deal with publication of IP methods as British Standards.
- (f) BSI to arrange a draft for public comment consultation whenever technical revision is proposed for an IP method published in the BS 2000 series, and to pass the comments received for consideration and response by the appropriate IP Sub-committee or Panel, subject to the responsibility of the BSI Technical Committee and approval of the final text for publication in accordance with usual BSI procedure.

2.3 It was subsequently decided that the IP methods in BS 2000 would be published in A4 format, instead of A5 as previously, with the added notes set alongside the clauses to which they refer of being grouped in the foreword.

It was agreed to divide the BS 2000 programme, referred to in 2.2(c), into annual batches of new or revised methods to be published in the spring as soon as possible after the IP book. The methods included in the first batch, all of which have been previously published as British Standards, are listed in table 1.

3. International methods

3.1 British Standard methods that are dual-numbered, i.e. identical with international standards published by ISO* or IEC†, or European Standards published by CEN‡ or CENELEC§ have been excluded from the list in table 1, even though the technical content may follow that of an IP method very closely. This is because it would inevitably cause confusion to publish the IP method in BS 2000, in parallel with another British Standard text of the same method; nor would it be acceptable arbitrarily to withdraw British Standard status from the international standards or European Standards concerned, merely because, for example, the IP method had been updated in some relatively minor respects. In the longer run, of course, it may be possible for the IP to adopt verbatim the internationally agreed text of such a method, in which case it could be introduced into BS 2000 without difficulty; some procedure would then be desirable to synchronize any subsequent updating which might become necessary on technical grounds.

3.2 For information, table 2 lists IP methods that correspond technically to International or European Standards, with the equivalent BS references. Of these methods, 14 are also listed in table 1.

4. Safety precautions

The following general paragraphs appear under this heading in the introductory pages of 'IP Standards : Part I'‡, and should therefore be read in conjunction with each method in BS 2000.

SAFETY PRECAUTIONS

Notice to users. It has been assumed by the compilers that all users of this book will, if not themselves fully trained, at least be under the supervision of a responsible trained person who will be familiar with all normal laboratory practice, and engineering practice as appropriate, and safety precautions, and that all such precautions will be observed. It is the responsibility of users to ensure that the requirements of the Health and Safety at Work etc. Act, 1974 are fully complied with.

It has also been assumed that reagents of adequate purity will be used, along with apparatus and equipment

of correct specification, properly maintained.

Specification for reagents, apparatus and equipment are given in manufacturers' catalogues and various standards specifications etc.

There are numerous handbooks on first aid, and on laboratory safety such as that issued by the Royal Institute of Chemistry. Where the compilers considered that a special hazard exists, attention has been drawn to this in the text. It cannot be too strongly emphasized that prompt first aid, decontamination, or administration of the correct antidote can save life, but that incorrect treatment can make matters worse.

It is emphasized that both supervisors and operators be familiar with emergency procedures before starting an operation involving any degree of hazard. Should any accident involving chemical contamination of the skin, ingestion or inhalation be such that medical attention is necessary, a doctor consulted should be made fully aware of the chemical composition of the contaminant and given any other relevant information which would assist him in deciding what specific measures in treatment should be taken. Such information might be obtained from technical data sheets from the supplier or from the label on the chemical container.

5. Sampling

5.1 Sampling procedures are not usually described in the IP methods, as it is assumed that the relevant instructions given in IP 51 'Sampling petroleum and products — Liquids, semi-solids and solids' will be followed. The sections on liquid sampling in that standard are technically equivalent to BS 3195 : Part 1, which is a dual-numbered version of ISO 3170 'Petroleum products — Liquid hydrocarbons — Manual sampling'. It is therefore recommended that BS 3195 : Part 1 should be used whenever liquid products are sampled for the purpose of testing in accordance with BS 2000, unless the method in question includes specific sampling instructions.

5.2 For sampling non-liquid products, general guidance is available in BS 5309.

5.3 For sampling electrical oils, preferred methods are given in BS 5263 and BS 5574.

*International Organization for Standardization.

†International Electrotechnical Commission.

‡European Committee for Standardization.

§European Committee for Electrotechnical Standardization.

‖Changes in editorial detail of these general paragraphs are under consideration by the IP and may be incorporated in the 1982 or subsequent editions of 'IP Standards : Part I'. In addition, it is expected that each method will have an introductory note drawing attention to the above general statement and stressing the need for attention to safety when carrying out the method of test.