

Specification for

Leaded petrol (gasoline) for motor vehicles

ICS 75.160.20

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The preparation of this British Standard was entrusted to Technical Committee PTI/2, Liquid fuels, upon which the following bodies were represented:

- Association of United Kingdom Oil Independents
- Automobile Association
- Chemical Industries Association
- Consumer Policy Committee of BSI
- Department of Trade and Industry (Oil and Gas Division)
- Department of Transport
- Federation of British Historic Vehicle Clubs
- Federation of Petroleum Suppliers
- Freight Transport Association
- Institute of Petroleum
- Institute of Road Transport Engineers
- Institute of Trading Standards Administration
- Ministry of Defence
- Motor Cycle Industry Association Ltd.
- National Farmers' Union
- Petrol Pump Manufacturers' Association
- Petrol Retailers Association
- Road Haulage Association Ltd.
- Royal Automobile Club
- Society of Motor Manufacturers and Traders Limited
- United Kingdom Petroleum Industry Association Ltd.
- World Wide Fund for Nature

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Foreword

This British Standard, which has been prepared under the direction of Technical Committee PTI/2, Liquid fuels, was first published in 1967 in response to a request from the then Consumer Council for a standard grading nomenclature to cover grades of petrol, available to the public as motor fuel in the United Kingdom. The grading system adopted was based on the research octane number (RON).

The first revision of the standard, published in 1971, incorporated a revision of the method for determination of RON and gave a fuller treatment of the interpretation of a single RON test result. Four amendments published during the period 1971 to 1976 provided for a progressive reduction in the limiting requirements for lead content.

The second revision, published in 1978, introduced a requirement for an additional grading in terms of motor octane number (MON) as being a more adequate representation of anti-knock performance. The method for expression of distillation limits was modified to align with the then current international practice and minimum limits for evaporation at 70 °C and 100 °C. The limit for existent gum was revised. A clause on sampling was introduced in the light of user experience with the standard. A minimum limiting requirement for lead content was introduced, in addition to the existing maximum limit to protect certain types of engine from valve seat recession.

The third revision, published in 1985, reduced the limiting requirement for lead content to 0.15 g/l maximum from 31 December 1985. It also recognized the increased sensitivity of some modern vehicle designs to petrol volatility by introducing recommended volatility levels appropriate to seasonal temperature variations in the UK for petrol supplied to service stations. As five star petrol was no longer in commercial use this grade was deleted from the 1985 revision.

The fourth revision, published in 1988, made provision for the future introduction of a limiting requirement for benzene content to be applicable from 1 October 1989 in accordance with EEC Directive 85/210/EEC of 20 March 1985. It also included provision to implement the EEC Directive on permitted levels of oxygenates in petrol (85/536/EEC). The test method in annex B was included in accordance with EEC Directive 87/441/EEC, permitting the use of national test methods in national specifications for petrol pending the preparation of a European Standard. The recommended seasonal volatility characteristics of the fourth revision were subsequently amended by AMD 6524.

This revision eliminates the star grading system, since only 4 star leaded petrol is now marketed in the United Kingdom. It also eliminates reference to a storage grade. It includes revised seasonal volatility requirements which were formerly recommendations. The summer fuel volatility has been changed to align with Statutory Instrument 1994 No. 2295.

The main purpose of this standard is to provide an indication to the retail buyer of the quality of 4 star leaded petrol in the United Kingdom market by defining limiting requirements for essential properties.

The fuel covered by this standard is intended for use in road vehicles whose engines are designed to use leaded petrol, including those vehicles designed to meet Economic Commission for Europe (ECE) and European Community emission standards.

This standard only covers requirements for leaded petrol. Requirements for unleaded petrol are specified in BS EN 228 and BS 7800.

NOTE. Testing. In the laboratory testing of petrol against the requirements of clause 4 of this British Standard it is necessary to use equipment and procedures exactly as laid down in the appropriate test methods. In particular, it is essential to use properly inspected and maintained standard co-operative fuel research committee (CFR) engines for the determination of both RON and MON. A useful guide to the satisfactory operation and test precision of a CFR engine can be obtained by including it in the Engine Test Correlation Programme of the Institute of Petroleum. Details of this programme are available from the Institute of Petroleum or the British Standards Institution.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

1 Scope

This British Standard specifies requirements for leaded petrol retailed in the United Kingdom for use in petrol engine vehicles without catalysts.

2 References

2.1 Normative references

This British standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 8. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publications apply to this British Standard when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Sampling

3.1 Sampling from storage tanks

For the purposes of this British Standard all sampling shall be carried out in accordance with the relevant procedures of BS 3195 : Part 1 and, additionally, as detailed in **3.2**.

NOTE 1. Attention is drawn to the special precautions needed for samples for the determination of Reid vapour pressure (see BS EN 12).

NOTE 2. The method described in **3.2** is designed for sampling the bulk fuel being fed to the offtake point. The examination of equipment, e.g. pumps, to detect faulty operation, may require the use of different techniques.

3.2 Sampling from pipelines

For the purposes of this British Standard, all sampling shall be carried out in accordance with the relevant procedures of either BS 3195 : Part 1 or BS 3195 : Part 2 and, additionally, as detailed in **3.3** (see note 2 to **3.1**).

BS 3195 : Part 2 shall be used in combination with a variable volume receiver which maintains the integrity of the sample.

3.3 Sampling from petrol pumps

3.3.1 Sampling cans of 5 l and 1 l capacity

The construction of the cans shall comply with the appropriate safety requirements for cans that are to hold highly flammable material. They shall be provided with screw caps incorporating a petroleum resistant washer in good condition. A stock of cans shall be kept solely for the purpose of taking petrol samples.

NOTE. Attention is drawn to the fact that sampling cans will need to conform to statutory safety requirements for the classification, packaging and labelling of dangerous substances.

3.3.2 Preparation of cans

New cans shall be rinsed with petrol before being used, to remove any residual traces of oil left during manufacturing operations, and then allowed to dry. Before use, all cans shall be checked to ensure that they are sound and free from leaks.

3.3.3 Sampling procedure

From the pump nozzle, 5 l of petrol shall be drawn carefully into a cool 5 l can using a clean, dry funnel. Immediately afterwards, this sample shall be decanted carefully into the requisite number of 1 l cans, using a funnel, filling the cans to within 15 mm of the brim.

If more than 5 l are needed, the operation shall be repeated immediately and before the pump has been used for any other purpose. The screw caps shall be tightened fully and the cans checked to ensure that there are no leaks.

The sampling procedure shall not be carried out in direct sunlight.

NOTE 1. If carried out in direct sunlight, changes in fuel quality, especially octane level, may occur.

NOTE 2. A quantity of 1 l is sufficient for the determination of octane number and certain other tests but it is advisable to provide each laboratory with 2 l of sample in case further work is needed. It is essential that these 2 l be of identical material.

3.3.4 Storage, labelling and transport

Samples shall be kept in a cool place although it is not necessary to keep them refrigerated.

NOTE 1. If left in direct sunlight there is a danger that the cans will 'balloon'.

Full and legible information relating to the source of the sample shall be attached to the can in such a manner that it will not easily become detached.

NOTE 2. If required, the sample may be sealed and labelled to maintain its legal integrity.

NOTE 3. If the sample has to be sent to a laboratory by public transport, it will be necessary to comply with the general regulations covering transportation of flammable materials and with the requirements of the transport authority concerned. Information on the appropriate procedures and the type of packaging required should be obtained from the transport authority involved.