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SPECIFICATION FOR
PETROL FOR MOTOR VEHICLES
(Second Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR PETROL FOR MOTOR VEHICLES
(Second Revision)

SLS 768:2021

Gr. 5

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Sri Lanka Standard
SPECIFICATION FOR PETROL FOR MOTOR VEHICLES
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FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Materials, Mechanical Systems and Manufacturing Engineering and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021-06-10.

This specification was first published in 1986 and subsequently revised in 1995. In this revision leaded petrol has been excluded and two variants; Regular and Premium based on the Research Octane Number have been introduced.

For the purpose of deciding whether a particular requirement of this specification is complied with the final value, observed or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with **SLS 102**. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

Guidelines for the determination of a compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in Appendix A.

In the preparation of this standard, the assistance derived from the publications of American Society for Testing and Materials (ASTM) and Energy Institute (IP) are gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of test for petrol/gasoline suitable for use as a fuel for vehicles having petrol engines.

This does not include aviation gasoline (avgas) supplied for use in aircraft.

2 REFERENCES

| | |
|-----------------------|--|
| IP 30 | Doctor Test |
| SLS ASTM D86 | Distillation of Petroleum Products |
| SLS ASTM D130 | Detection of Copper Corrosion |
| SLS ASTM D323 | Vapor Pressure of Petroleum Products (Reid Method) |
| SLS ASTM D381 | Existent Gum in Fuels by Jet Evaporation |
| SLS ASTM D525 | Oxidation Stability of Gasoline (Induction Period Method) |
| SLS ASTM D1266 | Sulfur in Petroleum Products (Lamp Method) |
| SLS ASTM D1298 | Relative Density of Crude Petroleum and Liquid Petroleum Products |
| SLS ASTM D2622 | Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry |
| SLS ASTM D2699 | Knock Characteristics of Motor Fuels (Research Method) |
| SLS ASTM D3237 | Lead in Gasoline by Atomic Absorption Spectroscopy |
| SLS ASTM D3341 | Lead in Gasoline - Iodine Monochloride Method |
| SLS ASTM D3606 | Determination of Benzene and Toluene in Finished Motor and Aviation Gasoline by Gas Chromatography |
| SLS ASTM D4052 | Density, Relative Density, and API Gravity of Liquids by Digital Density Meter |
| SLS ASTM D4057 | Manual Sampling of Petroleum and Petroleum Products |
| SLS ASTM D4177 | Automatic Sampling of Petroleum and Petroleum Products |
| SLS ASTM D4294 | Sulfur in Petroleum and Petroleum Products by Energy Dispersive X-ray Fluorescence Spectrometry |
| SLS ASTM D4806 | Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel |
| SLS ASTM D4815 | C ₁ to C ₄ Alcohols and MTBE in Gasoline by Gas Chromatography |
| SLS ASTM D4952 | Qualitative Analysis for Active Sulfur Species in Fuels and Solvents (Doctor Test) |
| SLS ASTM D5059 | Lead and Manganese in Gasoline by X-Ray Spectroscopy |
| SLS ASTM D5191 | Vapour Pressure of Petroleum Products (Mini Method) |
| SLS ASTM D5453 | Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, and Engine Oil by Ultraviolet Fluorescence |
| SLS ASTM D5501 | Ethanol and Methanol Content in Fuels Containing Greater than 20 % Ethanol by Gas Chromatography |
| SLS ASTM D5580 | Benzene, Toluene, Ethylbenzene, p/m-Xylene, o-Xylene, C ₉ and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography |
| SLS ASTM D6423 | pHe of Denatured Fuel Ethanol and Ethanol Fuel Blends |
| SLS ASTM D7328 | Total and Potential Inorganic Sulfate and Total Inorganic Chloride in Fuel Ethanol by Ion Chromatography Using Aqueous Sample Injection |
| SLS ASTM D7795 | Acidity in Ethanol and Ethanol Blends by Titration |
| SLS ASTM E1064 | Water in Organic Liquids by Coulometric Karl Fischer Titration |
| SLS EN 15837 | Phosphorus, copper and sulfur content by inductively coupled plasma optical emission spectrometry (ICP OES) |
| SLS ISO 1998-1 | Petroleum industry -Terminology- Part 1: Raw materials and products |
| SLS ISO 1998-2 | Petroleum industry -Terminology- Part 2: Properties and tests |
| SLS ISO 1998-3 | Petroleum industry -Terminology- Part 1: Raw materials and products |
| SLS ISO 1998-4 | Petroleum industry -Terminology- Part 4: Refining |
| SLS ISO 1998-5 | Petroleum industry -Terminology- Part 5: Transport, storage, distribution |

| | |
|------------------------|--|
| SLS ISO 1998-6 | Petroleum industry -Terminology- Part 6: Measurement |
| SLS ISO 1998-7 | Petroleum industry -Terminology- Part 5: Miscellaneous terms |
| SLS ISO 1998-99 | Petroleum industry -Terminology- Part 99: General and index |
| SLS 102 | Presentation of Numerical Values |

3 DEFINITIONS

For the purpose of this standard, definitions given in in all parts of **SLS ISO 1998** and following definitions shall apply.

- 3.1 petrol (Motor Gasoline):** A volatile mixture of liquid hydrocarbon, suitable for use as a fuel in spark ignition and internal combustion engines.
- 3.2 ethanol Added Petrol (Motor Gasoline):** A fuel consisting primarily of Petrol as described above doped with denatured Ethanol for fuel.
- 3.3 lot:** Each container of diesel fuel in any consignment belonging to one batch of manufacture or supply.
- 3.4 manufacturer:** The establishment responsible for the quality of petrol manufactured.
- 3.5 distributor:** The establishment responsible for the quality of petrol distributed in Sri Lanka.
- 3.6 GHS category:** Flammable liquid category defined in the globally harmonised system for the classification and labelling of chemicals.

4 REQUIREMENTS

4.1 General requirements

The material shall be a refined petroleum distillate, free from water, foreign matter and other visible impurities.

4.2 Other requirements

4.2.1 Regular Petrol and Premium Petrol

The material shall comply with the requirements specified in Table 1 when tested in accordance with the test methods specified in Column 5 of Table 1.

TABLE 1 - Requirements of Regular Petrol and Premium Petrol

| Characteristic (1) | Requirement | | Method of test ¹ (4) |
|---|----------------------------|----------------------------|--|
| | Regular Petrol (2) | Premium Petrol (3) | |
| Appearance | Clear and bright | Clear and bright | Visual inspection |
| Density at 15 °C, kg/m ³ | 725 to 780 | 725 to 780 | SLS ASTM D1298 SLS ASTM D4052 |
| Reid Vapour pressure (RVP) at 37.8 °C, kPa, max. | 70 | 70 | SLS ASTM D5191 SLS ASTM D323 |
| Research Octane number (RON), min. | 91 | 95 | SLS ASTM D2699 |
| Motor Octane number (MON), min | 81 | 85 | SLS ASTM D2700 |
| Distillation characteristics Recovery upto 70 °C(E-70), % v/v Recovery upto 100 °C(E-100), % v/v Recovery upto 150 °C(E-150), % v/v, min | 10 to 45 40 to 70 75 | 10 to 45 40 to 70 75 | SLS ASTM D86 |
| Final boiling point, °C, max | 210 | 210 | |
| Residue % v/v, max | 2 | 2 | |
| Benzene, per cent by volume, max. | 1 | 1 | |
| Lead, as Pb, g/l, max. | 0.005 | 0.005 | SLS ASTM D3237 SLS ASTM D5059 SLS ASTM D3341 |
| Sulfur, per cent by mass, max. | 0.005 | 0.005 | SLS ASTM D1266 SLS ASTM D4294 SLS ASTM D2622 SLS ASTM D5453 |
| Oxidation stability, minutes, at 100 °C min. | 360 | 360 | SLS ASTM D525 |
| Gum (Solvent washed), mg/100 ml, max. | 5 | 5 | SLS ASTM D381 |
| Copper strip corrosion, 3 hours at 50 °C, max. | Classification 1 | Classification 1 | SLS ASTM D130 |
| Oxygenates content, (MTBE, ETBE, TAME), volume, max. | 15 | 15 | SLS ASTM D4815 |
| Doctor test or RSH content | Negative or < 15mg/kg | Negative or < 15mg/kg | IP 30 SLS ASTM D4952 |
| Olefins content % v/v max | 21 | 18 | SLS ASTM D1319 |
| Oxygen content % m/m, max | 2.7 3.9 for E5 and E10 | 2.7 3.9 for E5 and E10 | SLS ASTM D4815 |
| Ethanol ² content (E5) % v/v Max (E10) % v/v Max | 5 10 | 5 10 | SLS ASTM D4815 |
| ¹ Unless specified otherwise chemicals of analytical grade and distilled water shall be employed in tests | | | |
| ² Ethanol must conform to the requirements specified in Table 2 | | | |

In relation to a parameter mentioned in an item of the following table, ethanol in petrol must comply with the specification for that parameter mentioned in that item

TABLE 2 - Requirements for ethanol

| Parameter | Requirement | Test Method³ |
|-------------------------|---|--------------------------------|
| Acidity- as acetic acid | 0.006% m/m ,max | SLS ASTM D7795 |
| Appearance | Clear and bright and visibly free of suspended or precipitated contaminants | SLS ASTM D4806 |
| Copper | 0.1 mg/kg maximum | SLS EN 15837 |
| Denaturant | 1–1.5% v/v denaturant | SLS ASTM D5501 |
| Ethanol | 95.6% v/v , min | SLS ASTM D5501 |
| Inorganic chloride | 10 mg/kg, max | SLS ASTM D7328 |
| Methanol | 0.5% v/v , max | SLS ASTM D5501 |
| pH | 6.5–9.0 | SLS ASTM D6423 |
| Solvent washed gum | 5.0 mg/100 mL , max | SLS ASTM D381 |
| Sulfate | 4.0 mg/kg, max | SLS ASTM D7328 |
| Sulfur | 10 mg/kg ,,max | SLS ASTM D5453 |
| Water | 1.0% m/m , max | SLS ASTM E1064 |

³ Unless specified otherwise chemicals of analytical grade and distilled water shall be employed in tests

The denaturant component of ethanol must be petrol.

NOTE:

Necessary safeguards against the risks arising from the storage and handling of large volumes of flammable liquids shall be provided and all precautions shall be taken at all times to prevent accidents by fire or explosion.

5 MARKING

5.1 Dispensing unit

Each dispensing unit shall be legibly and indelibly marked with the particulars as given in (a) to (g) below:

- a) Generic name of the product;
i.e. **Regular Petrol / Premium Petrol**
- b) Octane number;
- c) Ethanol content; if applicable
i.e. **E5/ E10**
- d) Name and address of the manufacturer/ distributor;
- e) Registered trade mark, if any;
- f) The words “Flammable Liquid”;
- g) Following international identification symbol for flammable chemicals.



5.2 Container

Each container in which petrol fuel is stored and transported shall be legibly and indelibly marked with the particulars as given in (a) to (g) below:

- a) Generic name of the product;
i.e. **Regular Petrol / Premium Petrol**
- b) Name and address of the manufacturer/ distributor;
- c) Registered trade mark, if any;
- d) Volume of the content, in litres ;
- e) The words “Highly Flammable Liquid” ;
- f) Following international identification symbol for flammable chemicals; and



- g) GHS Category 3 liquid

NOTE: Attention is drawn to the certification marking facilities offered by the Sri Lanka Standards Institution. See inside back cover of this standard.

6 PACKAGING

The dispensing unit and container in which petrol fuel is stored and transported shall be clean, leak proof and free from grit, impurities and materials soluble in petrol.

Necessary safeguards against the risks arising from the storage and handling of large volumes of flammable liquids shall be provided and all precautions shall be taken at all times to prevent accidents by fire or explosion.

7 SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Sampling shall be in accordance with Appendix A.

7.2 Criteria for conformity shall be in accordance with Appendix A.

**APPENDIX A
COMPLIANCE OF A LOT**

the sampling scheme given in this appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assured based on manufacture's control systems coupled with type testing and check tests or any other procedure, appropriate schemes of sampling and inspection should be adopted.

A.1 SAMPLING

Samples of the material shall be drawn as per procedure specified in **SLS ASTM D4057** or in **SLS ASTM D4177**, as appropriate. The samples so drawn shall be deemed to represent the lot.

A.2 NUMBER OF TESTS

A.2.1 The container selected as in **A.1** shall be inspected for marking and packaging requirements.

A.2.2 The sample selected as in **A.3** shall be tested for the requirements given in **4.1** and **4.2**

A.3 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if **A.3.1** and **A.3.2** conditions are satisfied.

If one or more of the conditions in **A.3.1** and **A.3.2** does not satisfy, the lot shall be declared as not conforming to the requirements of this standard.

A.3.1 The container inspected as in **A.2.1** conforms to the relevant requirements.

A.3.2 The sample tested as in **A.2.2** conforms to the relevant requirements.

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SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI which includes surveillance inspection of the factory, testing of both factory and market samples.

Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.



SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.