SRI LANKA STANDARD 1103:2021

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SPECIFICATION FOR

AUTOMOTIVE DIESEL FUEL
(DIESEL FUEL)

(First Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR AUTOMOTIVE DIESEL FUEL (DIESEL FUEL)
(First Revision)

SLS 1103:2021

Gr. 5

SRI LANKA STANDARDS INSTITUTION
No.17, Victoria Place
Off Elvitigala Mawatha
Colombo 8
SRI LANKA

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This Standard does not purport to include all the necessary provisions of a contract

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SPECIFICATION FOR AUTOMOTIVE DIESEL FUEL (DIESEL FUEL)
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FOREWORD

This 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 standard was first published in 1995 and this is the first revision of the standard. It introduces specifications for auto diesel/regular diesel and low sulphur diesel/ super diesel fuel.

For the purpose of deciding whether a particular requirement of this standard 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 figures to be retained in the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard the assistance derived from the publications of American Society for Testing and Materials (ASTM), Energy Institute (IP), International Organization for Standardization (ISO) and European Committee for Standardization (CEN) are gratefully acknowledged.

1 SCOPE

This standard specifies requirements, packaging, marking and methods of test for automotive diesel fuel, suitable for light duty or heavy duty or stationary diesel engines operating in on-road or off-road applications.

For the purpose of this standard, automotive diesel fuel shall be classified as two variants namely auto diesel or regular diesel and low sulphur diesel or super diesel.

2 REFERENCES

IP 391	Determination of aromatic hydrocarbon types in middle distillates - High performance liquid chromatography method with refractive index detection
SLS ASTM D93	Flash point by Pensky-Martens closed cup tester
SLS ASTM D130	Corrosiveness to Copper from Petroleum Products by Copper Strip Test
SLS ASTM D445	Kinematic Viscosity of Transparent and Opaque Liquids
SLS ASTM D473	Sediment in Crude Oils and Fuel Oils by the Extraction Method
SLS ASTM D482	Ash from Petroleum Products

SLS ASTM D974	Acid and Base Number by Color-Indicator Titration
SLS ASTM D1298	Density, Relative Density or API Gravity by Hydrometer Method
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 by Energy Dispersive X-ray Fluorescence Spectrometry
SLS ASTM D4530	Determination of Carbon Residue (Micro Method)
SLS ASTM D4737	Calculated Cetane Index by Four Variable Equation
SLS ASTM D5453	Total Sulfur by Ultraviolet Fluorescence
SLS ASTM D6304	Water by Coulometric Karl Fischer Titration
SLS ASTM D6751	Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels
SLS EN 12916	Aromatic hydrocarbon types in middle distillates - High performance liquid chromatography method with refractive index detection
SLS EN 14078	Fatty acid methyl ester (FAME) content in middle distillates. Infrared spectrometry method
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 ISO 12937	Determination of water - Coulometric Karl Fischer titration method

3 DEFINITIONS

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

3.1 diesel: All fuel supplied or represented as automotive diesel fuel including renewable diesel and synthetic diesel and any combination of these.

3.2 renewable diesel: Liquid fuel that is manufactured by chemically altering and hydrotreating (or equivalent) vegetable oils, animal fats, organic waste and other biomass, but also includes non-organic waste that cannot be reasonably recycled. It is not directly made from any fossil fuel.

3.3 synthetic diesel*:* Paraffinic diesel manufactured by chemically altering any feedstock.

3.4 biodiesel*:* A renewable, biodegradable, mono alkyl ester combustible liquid fuel that is derived from vegetable oils or animal fats and meets the **SLS ASTM D6751** specification for biodiesel fuel (B100) blend stock for distillate fuels.

3.5 GHS category: Flammable liquid category defined in the globally harmonised system for the classification and labelling of chemicals

3.6 lot: Each container of diesel fuel in any consignment belonging to one batch of manufacture or supply.

3.7 manufacturer: The establishment responsible for the quality of automotive diesel fuel (diesel fuel) manufactured

3.8 distributor: The establishment responsible for the quality of automotive diesel fuel (diesel fuel) distributed in Sri Lanka.

4 REQUIREMENTS

4.1 General Requirements

Automotive diesel fuel shall be hydrocarbon oil derived from petroleum (upto 5% Bio fuel meeting **SLS ASTM D6751** is allowed). Diesel shall be free from grit, suspended matter and other visible impurities.

4.2 Other requirements

Automotive diesel fuel shall also comply with the requirements specified in Table **1** when tested in accordance with the methods indicated in Column 4 of Table **1**.

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

TABLE 1- Requirements for diesel fuel

Property	Requirement		Test method (4)
	Auto Diesel/ Regular Diesel	Low Sulphur Diesel / Super Diesel	
(1)	(2)	(3)	
Appearance	Clear and bright	Clear and bright	Visual inspection
Density at 15 ^{0}C, kg/m^3	820-860	820-860	**SLS ASTM D1298**
Cetane index, min	46	46	**SLS ASTM D4737**
Flash point, min	60	60	**SLS ASTM D93**
Viscosity at 40^{0}C, mm^2/s	2.00-4.50	2.00-4.50	**SLS ASTM D445**
Distillation,95% v/v, recovery, °C, max	360	360	**SLS ASTM D86**
Total Sulphur, mg/kg, max	500	10	**SLS ASTM D4294** **SLS ASTM D5453**
Carbon residue on 10 percent volume distillation residue,% mass, max	0.2	0.2	**SLS ASTM D4530**
Ash per cent by mass, max	0.01	0.01	**SLS ASTM D482**
Water Content, ppm, max	500 [a]	200	**SLS ISO 12937** **SLS ASTM D6304**
Sediment by extraction per cent by mass, max	0.01	0.01	**SLS ASTM D473**
Copper strip corrosion for 3 h at 50°C	Not less than Classification 1	Not less than Classification 1	**SLS ASTM D130**
Total acidity	0.20	0.20	**SLS ASTM D974**
Polycyclic Aromatic Hydrocarbon (PAH), % m/m, max	11	11	**IP 391** **SLS EN 12916**
Biodiesel [b] content , % v/v, max	5%	5%	**SLS EN 14078**
[a] If diesel contains biodiesel, maximum water content shall be 200 ppm [b] Biodiesel should comply with **SLS ASTM D6751**			

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 of explosion*

5 MARKING

5.1 Dispensing unit

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

a) Generic name of the product;
   i.e. **Auto Diesel/ Regular Diesel** or **Low Sulphur Diesel/ Super Diesel**
b) Biodiesel percentage, if applicable;
c) The words “Flammable Liquid” ;
d) Following international identification symbol for flammable chemicals; and

e) GHS Category 4 liquid.

5.2 Container

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

a) Generic name of the product;
   i.e. **Auto Diesel/ Regular Diesel** or **Low Sulphur Diesel/ Super Diesel**
b) Biodiesel percentage, if applicable;
c) Name and address of the manufacturer/ distributor;
d) Registered trade mark, if any;
e) Volume of the content, in litres ;
f) The words “Flammable Liquid” ;
g) Following international identification symbol for flammable chemicals; and

h) GHS Category 4 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 automotive diesel fuel is stored and transported shall be clean, leak proof and free from grit, impurities and materials soluble in diesel.

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 of 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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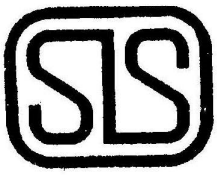
SLS CERTIFICATION MARK

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.*



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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.

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