



INDIAN STANDARDS ON PETROLEUM PRODUCTS AND ITS TEST METHODS

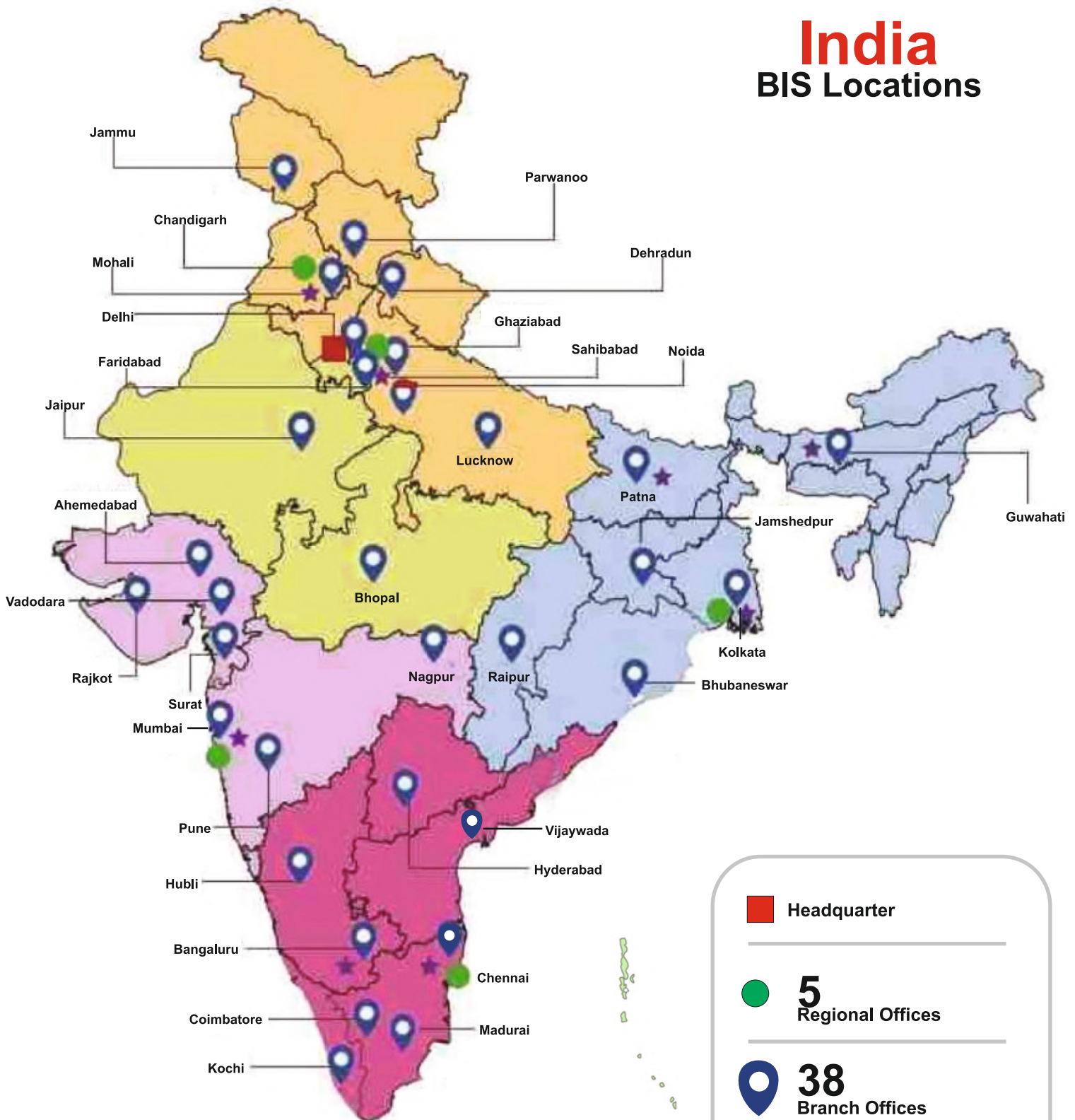
BUREAU OF INDIAN STANDARDS
Ministry of Consumer Affairs,
Food and Public Distribution,
Government of India

भारतीय मानक ब्यूरो
उपभोक्ता मामले, खाद्य और
सार्वजनिक वितरण मंत्रालय
भारत सरकार

NORTHERN CENTRAL EASTERN WESTERN SOUTHERN

India

BIS Locations



-  **Headquarter**
-  **5**
Regional Offices
-  **38**
Branch Offices
-  **8**
Laboratories
-  **Training Institute (NITS)**





ABOUT BIS

Bureau of Indian Standards (BIS), the National Standards Body (NSB) of India was established under the *BIS Act, 1986* and came into existence on 1 April 1987 assuming the functions of the erstwhile Indian Standards Institution (ISI). The ISI was established on 6 January 1947. *The BIS Act, 2016* came into force on 12 October 2017 superseding *BIS Act 1986*. *The BIS Act, 2016* provides for the establishment of a national standards body for the harmonious development of the activities of standardization, conformity assessment and quality assurance of goods, articles, processes, systems and services and for matters connected therewith or incidental thereto.

BIS through its core activities of standardization and conformity assessment, has been benefiting the national economy by providing safe, reliable and quality goods; minimizing health hazards to consumers; protecting the environment; controlling over proliferation of varieties; promoting exports and imports substitutes, etc. The standardization and conformity assessment schemes of BIS apart from benefitting the consumers and industry also support various public policies especially in areas of product safety, consumer protection, food safety, environment protection, building and infrastructure development, etc.

BIS also represents India in international standards bodies like International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) and participates actively in the international standardization work undertaken by these bodies. BIS presents the national viewpoints on new areas taken up for international standardization and on various draft international standards during the process of development of these standards so that the country's interest is protected and reflected in these standards. This also enables the BIS technical committees to consider adoption of the international standards as Indian Standards, with or without modifications, in order to enable our products and services to integrate with global trade and commerce.

What are Standards?

Standard is a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.

Importance of Standardization

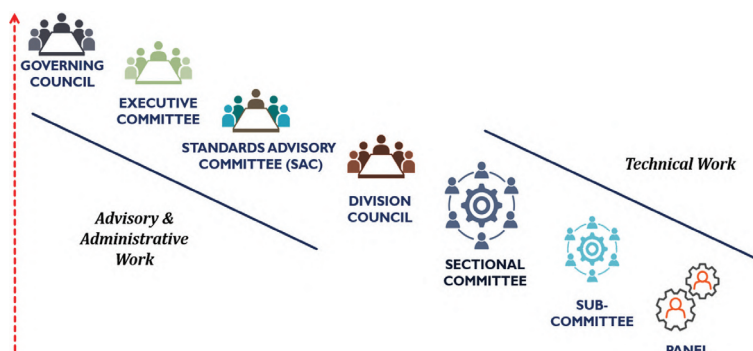
Standardization is the process of developing technical standards through consensus of different parties. This standardization aims to address one or all of compatibility, interchangeability, variety control, safety, environment protection, product protection and fitness for purpose. Standards provide numerable benefits to the technologists, producers, consumers and traders besides defining purpose for each of these entities.

Standards can be formulated at various levels ranging from an individual through National (IS) to International level (ISO). Also, depending on the subject in hand, standards can be made on various aspects such as terminology, specification, sampling, testing, code of good practice, systems and services.

STANDARDIZATION ACTIVITY OF BIS

Standardization Structure

There are 16 Technical Departments formulating standards in various subject areas. Corresponding to these departments, 16 division councils exist. Each division council has several sectional committees working under it. The standards cover important segments of economy and help the industry in upgrading the quality of their goods and services.

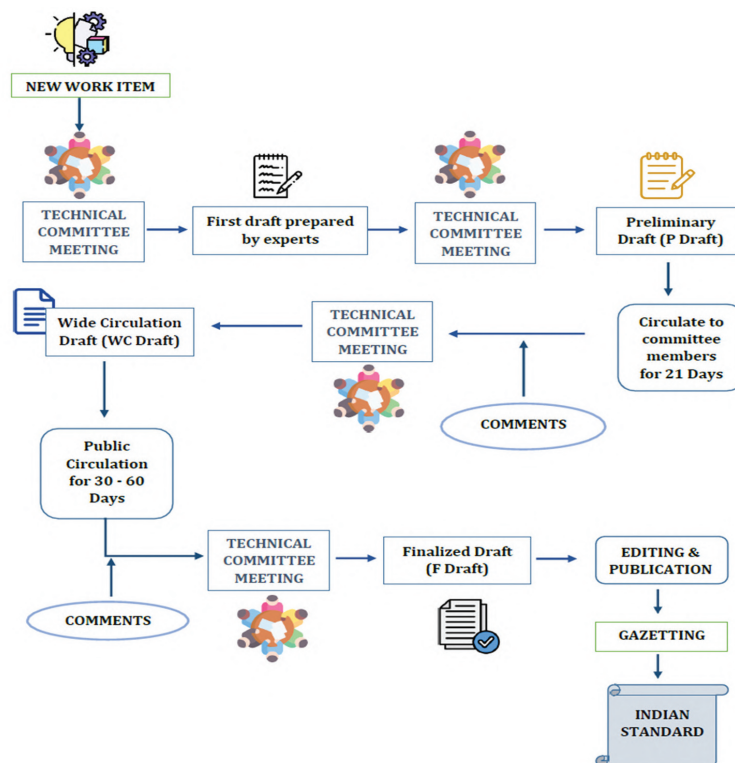
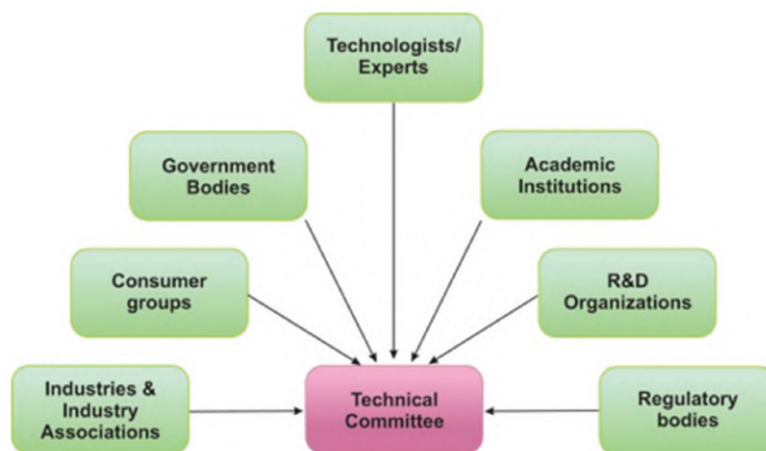


Ayush Division Council (AYDC)	Chemical Division Council (CHDC)	Civil Engineering Division Council (CEDC)	Electro-Technical Division Council (ETDC)
Electronics & Telecommunication Division Council (LITDC)	Food and Agriculture Division Council (FADC)	Mechanical Engineering Division Council (MEDC)	Management and Systems Division Council (MSDC)
Metallurgical Engineering Division Council (MTDC)	Medical Equipment & Hospital Planning Division Council (MHDC)	Petroleum, Coal & Related Products Division Council (PCDC)	Production and General Engineering Division Council (PGDC)
Transport Engineering Division Council (TEDC)	Textile Division Council (TXDC)	Water Resources Division Council (WRDC)	Service Sector Division Council (SSDC)

Standards Formulation Process

The Indian Standards are developed by technical committees that are representative of various stakeholders having interest in the relevant subject of standardization under the scope of such committees through a process of consultation so that views of all are given due consideration and a consensus is evolved in formulating a standard. The stakeholders involved in national standardization can broadly be categorized as industry, consumers/users, technologists (R&D and scientific institutions, academia, individual subject experts, etc) and government departments/regulators.

The process of standards development of BIS is aligned with accepted international best practices that are based on the core principles of openness, transparency, impartiality and consensus. The process begins with the identification of the standardization needs of the given sector or subject following which the development of the standard is taken up and planned by the relevant technical committee. Apart from consultation within the technical committees, draft standards are also open for public views/comments.



Standards Development Process Flow



PETROLEUM, COAL AND RELATED PRODUCTS DEPARTMENT (PCD)

PCD is one of the 15 technical departments of BIS with the scope “Standardization in the field of petroleum, lubricants, bio-fuels, solid mineral fuels, gaseous fuels, bitumen, coal tar, organic chemicals, dye-intermediates, plastics (including adhesives and composites) safety of toys, rubber, cosmetics and fragrance & flavour ingredients”.

PCDC is division council of PCD department.

The aspect wise breakup of the standards formulated by PCDC as on 05 January 2023 is given below:

Aspect	No. of Standards
Product Standards	756
Methods of Test	637
Codes of Practice	37
Terminology	28
Dimensions	1
System Standard	0
Safety Standard	6
Others	54
Total	1519

PCD, BIS is a ‘P’ member (Participating member) in 33 committees and ‘O’ Member (Observer member) in 1 committees of ISO.

List of Technical Committees working under PCD

Under PCD, there are 15 Sectional Committees working in various subject areas. List of committees with their scope is as follows:

Technical Committee Number	Technical Committee Name	SCOPE
PCD 01	Methods for Sampling and test for Petroleum and related products of natural or synthetic origin including lubricants, greases, specialty products, additives and gaseous fuels (excluding bitumen)	a) To formulate Indian Standards for Methods for Sampling and test for Petroleum and related products of natural or synthetic origin including lubricants, greases, specialty products, additives and gaseous fuels (excluding bitumen) b) To organize correlation schemes for evaluating the accuracy and the performance of fuel and lubricant testing engines
PCD 03	Petroleum and their Related Products of Synthetic or Biological Origin	To formulate Indian Standards for terminology; petroleum, petroleum products, biofuels (liquid and gas), fuels produced through synthesis route, specification for natural gas and codes of practice for storage, handling, transport and application.

PCD 06	Bitumen, Tar and Related Products	To formulate Indian standards for terminology, methods of sampling and test and specification for bitumen including bitumen cutback and bitumen emulsion, bitumen additives, modified bitumen, industrial bitumen, bituminous mixes.
PCD 07	Solid Mineral Fuels and Solid Biofuels	To formulate Indian Standards for a) Terminology, methods of sampling and test, codes of practice, classification by size and type, petrographic analysis and specification for solid mineral fuel b) Terminology, methods of sampling and test, codes of practice, classification and specification for raw and processed materials originating from arboriculture, agriculture, aquaculture, horticulture and forestry to be used as a source for solid bio-fuels.
PCD 09	Organic Chemicals, Alcohols and Allied Products	To formulate Indian Standards for terminology, method of sampling and test and specifications for organic chemicals, ion-exchange resin for general industrial use, alcohols & allied products.
PCD 12	Plastics	To formulate Indian Standards for specifications for thermosetting and thermoplastic resins-bonded and moulding materials; natural and synthetic polymers, synthetic resin bonded laminates thermoplastic films and sheets, plasticizers cellular plastics, finished plastic articles, composites and reinforced plastics (excluding sanitary wares and plastic pipes for water supply and plastic packaging containers) safety of toys, and natural and synthetic adhesives (excluding for plywood industry and electrical tapes).
PCD 13	Rubber and Rubber Products	To formulate Indian Standards for terminology, environmental aspects, code of practice, specifications for natural rubber, synthetic rubber, reclaimed rubber, vulcanized rubber and rubber products (excluding rubber conveyors and transmission belting, rubber cables and rubber products for automobile industry), hoses & hose assemblies, elastomeric isolators, raw materials for rubber and rubber industry, flexible and semi-rigid cellular materials [made of rubber and thermoplastic rubbers (TPE & TPR)] and coated fabrics.
PCD 18	Fragrance and Flavour	To formulate Indian Standards for terminology, methods of sampling and test, codes of practices and specifications for fragrance and flavouring ingredients.
PCD 19	Cosmetics	To formulate Indian Standards for terminology, methods of sampling and test, codes of practice and specifications for raw materials for cosmetics and toilet goods (excluding soaps) and for finished products.
PCD 21	Plastics Packaging	Formulation of Indian Standards on rigid, semi-rigid and flexible plastics containers, closures and their methods of test and To coordinate with the work of ISO/TC 61 'Plastics' and ISO/TC 122 'Plastic Packaging' only, so far as it concerns its own scope.
PCD 25	Lubricants and their Related Products	To formulate Indian Standards for terminology; lubricants, bio-lubricants, lubricating oils and their related products like hydraulic fluids, corrosion preventives, quenching and cutting oils, lubricant produced

		through synthesis routes and codes of practice for storage, handling, transport and application.
PCD 26	Dye Intermediates	To formulate Indian Standards for terminology, method of sampling and test and specifications for dye intermediates.
PCD 27	Methods of Sampling and Test for Plastics	To formulate Indian Standards for terminology, methods of sampling and test for plastics.
PCD 29	Methods of Test for Rubber and Rubber Products	To formulate Indian Standards for methods of sampling and test of rubber and rubber products.
PCD 30	Toys and Related Test Methods Sectional Committee	To formulate Indian Standards for terminology, specifications, test methods, code of practice and safety of toys including handmade toys.

PETROLEUM PRODUCTS AND TEST METHODS

- Methods of Sampling and Test for Petroleum and Related Products of Natural or Synthetic Origin (excluding bitumen) sectional committee, PCD 1 is one of the 15 sectional committees working under PCDC with the scope “To formulate Indian Standards for Methods for Sampling and test for Petroleum and related products of natural or synthetic origin including lubricants, greases, speciality products, additives and gaseous fuels (excluding bitumen) b) To organize correlation schemes for evaluating the accuracy and the performance of fuel and lubricant testing engines”.
- This committee has formulated total **200** Indian standards. Complete list of standards formulated by this committee has been placed below.

Sl No.	IS No.	Title
1.	IS 1447 (Part 1) : 2021	Methods of Sampling of Petroleum and its Products Part 1 Manual Sampling (Second Revision)
2.	IS 1447 (Part 2) : 2013 / ISO 4257: 2001	Methods of sampling of petroleum and its products [p : 2] liquefied petroleum gases - Method of sampling (Second Revision)
3.	IS 1447 (Part 3) : 2021	Petroleum and its products methods of sampling: Part 3 method of sampling of semi - Solid and solid petroleum products First Revision
4.	IS 1447 (Part 4) : 1989	Petroleum and its products methods of sampling: Part 4 sampling of petroleum coke for laboratory analysis (First Revision)
5.	IS 1447 (Part 5) : 2023 / ISO 23572 : 2020	Methods of sampling of petroleum and its products Part Sampling of greases
6.	IS 1448 (Part 1/Sec 2) : 2002	Methods of test for petroleum and its products [p: 1/ section 2] determination of base number of petroleum products by potentiometric titration (Second Revision)
7.	IS 1448 (Part 2) : 2007 / ISO 6619: 1988	Methods of test for petroleum and its products [p:2] petroleum products and lubricants - Neutralization number - Potentiometric titration method (Second Revision)
8.	IS 1448 (Part 3) : 2007 / ISO 2977: 1997	Methods of test for petroleum and its products [p:3] petroleum products and hydrocarbon solvents - Determination of aniline point and mixed aniline point (Third Revision)

9.	IS 1448 (Part 4/Sec 1) : 2021	Methods of test for petroleum and its products P : 4 Sec 1 Determination of ash
10.	IS 1448 (Part 4/Sec 2) : 2021	Methods of test for petroleum and its products p : 4 section 2 ash from grease sulphated ash and water soluble ash Fourth Revision
11.	IS 1448 (Part 5) : 1970	Methods of test for petroleum and its products: Part 5: burning quality (First Revision)
12.	IS 1448 (Part 6) : 1984	Methods of test for petroleum and its products (P:6) heat of combustion of liquid hydrocarbon fuels by bomb calorimeter method (First Revision)
13.	IS 1448 (Part 7) : 2004	Methods of Test for Petroleum and its Products - Part 7: Determination of Calorific Value by Calculation
14.	IS 1448 (Part 8) : 2012 ISO 4262 : 1993	Methods of test for petroleum and its products [p : 8] determination of carbon residue - Ramsbottom method (Second Revision)
15.	IS 1448 (Part 9) : 2019 / ISO 5165 : 2017	Methods of Test for Petroleum and its Products [P : 9] Determination of the Ignition Quality of Diesel Fuels - Cetane Engine Method (Second Revision)
16.	IS 1448 (Part 10/Sec 1) : 2021ISO 3015	Methods of test for petroleum and its products Part 10 Petroleum and related products from natural or synthetic sources Section 1 Determination of cloud point
17.	IS 1448 (Part 10/Sec 2) : 2021 /ISO 3016	Methods of test for petroleum and its products Part 10 Petroleum and related products from natural or synthetic sources Section 2 Determination of pour point
18.	IS 1448 (Part 11) : 2004 / ISO 3013: 1997	Methods of test for petroleum and its products [p:11] petroleum products - Determination of freezing point of aviation fuels (Fourth Revision)
19.	IS 1448 (Part 12) : 2013 / ISO 2049 :1996	Methods of test for petroleum and its products [p : 12] determination of colour (ASTM Scale) (Second Revision)
20.	IS 1448 (Part 13) : 2023	Petroleum and its Products - Methods of Test Part 13 colour by lovibond tintometer
21.	IS 1448 (Part 14) : 2019	Methods of test for petroleum and its products [p : 14] colour by saybolt chromometer (First Revision)
22.	IS 1448 (Part 15) : 2004 / ISO 2160	Methods of Test for Petroleum and Its Products - Part 15: Petroleum Products - Corrosiveness to Copper - Copper Strip Test
23.	IS 1448 (Part 16) : 2014 / ISO 3675 : 1998	Methods of test for petroleum and its products [p : 16] crude petroleum and liquid petroleum products - Laboratory determination of density - Hydrometer method (Fourth Revision)
24.	IS 1448 (Part 18) : 2020	Methods of Test for Petroleum and its Products Part 18 Distillation of Petroleum Products (Third Revision)
25.	IS 1448 (Part 19) : 2015 / ISO 5275 : 2003	Methods of test for petroleum and its products [p : 19] detection of thiols and other sulphur species - Doctor test (Second Revision)
26.	IS 1448 (Part 20) : 2019 / ISO 13736:2013	Methods of test for petroleum and its products [p : 20] determination of flash point - Abel closed - Cup method (Third Revision)

27.	IS 1448 (Part 21) : 2019 / ISO 2719	Methods of test for petroleum and its products [p : 21] determination of flash point - Pensky - Martens closed cup method (Fourth Revision)
28.	IS 1448 (Part 22) : 2019	Methods of test for petroleum and its products [p : 22] determination of asphaltenes (Heptane Insolubles) in crude petroleum and petroleum products (Third Revision)
29.	IS 1448 (Part 23) : 2004 ISO 3837	Methods of Test for Petroleum and its Products - Part 23: Liquefied Petroleum Gases - Determination of Hydrocarbon Types - Fluorescent Indicator Adsorption Method
30.	IS 1448 (Part 25/Sec 1): 2018 ISO 3104	Methods of test for petroleum and its products [p : 25] transparent and opaque liquids section 1 determination of kinematic viscosity and calculation of dynamic viscosity (Second Revision)
31.	IS 1448 (Part 26) : 2018 ISO 5163 :2014	Methods of test for petroleum and its products [p : 26] determination of knock characteristics of motor and aviation fuels - Motor method (Second Revision)
32.	IS 1448 (Part 27) : 2018 / ISO 5164: 2014	Methods of test for petroleum and its products [p : 27] determination of knock characteristics of motor fuels - Research method (Second Revision)
33.	IS 1448 (Part 28) : 2008 / ISO 7536	Methods of test for petroleum and its products [p : 28] petroleum products - Determination of oxidation stability of gasoline - Induction period method (Fourth Revision)
34.	IS 1448 (Part 29) : 2021 / ISO 6246	Methods of test for petroleum and its products Part 29 Petroleum products Gum content of fuels Jet evaporation method
35.	IS 1448 (Part 30) : 2013 / ISO 3735: 1999	Methods of test for petroleum and its products [p : 30] crude petroleum and fuel oils - Determination of sediment - Extraction method (Second Revision)
36.	IS 1448 (Part 31) : 2017	Methods of test for petroleum and its products [p : 31] determination of smoke point (Second Revision)
37.	IS 1448 (Part 32) : 2019 ISO 3838	Methods of test for petroleum and its products [p : 32] crude petroleum and liquid or solid petroleum products - Determination of density or relative density - Capillary stoppered pyknometer and graduated bicapillary pyknometer methods (Third Revision)
38.	IS 1448 (Part 33) : 2021	Methods of test for petroleum and its products: Part 33 Sulphur by Bomb method
39.	IS 1448 (Part 34) : 1979	Methods of test for petroleum and its products - Part 34 : determination of sulphur in petroleum products (Lamp Method) (Second Revision)
40.	IS 1448 (Part 39) : 2012 / ISO 3007:1999	Methods of test for petroleum and its products [p : 39] determination of vapour pressure - Reid method (Second Revision)
41.	IS 1448 (Part 40) : 2015 / ISO 3733 : 1999	Methods of test for petroleum and its products [p : 40] petroleum products and bituminous materials - Determination of water - Distillation method (Fourth Revision)
42.	IS 1448 (Part 41) : 2019 / ISO 9030:1990	Methods of test for petroleum and its products [p : 41] crude petroleum - Determination of water and sediment - Centrifuge method (Fourth Revision)

43.	IS 1448 (Part 42) : 2015 / ISO 6250 : 1997	Methods of test for petroleum and its products [p : 42] determination of the water reaction of aviation fuels (Third Revision)
44.	IS 1448 (Part 43) : 2018	Methods of test for petroleum and its products [p : 43] bromine number by colour indicator method (Third Revision)
45.	IS 1448 (Part 44) : 2013 / ISO 3839: 1996	Methods of test for petroleum and its products [p : 44] determination of bromine number of distillates and aliphatic olefins - Electrometric method (Third Revision)
46.	IS 1448 (Part 50) : 2021	Methods of test for petroleum and its products: Part 50 Chlorine in new and used lubricants (sodium alcoholate method)
47.	IS 1448 (Part 51) : 2023	Methods of test for petroleum and its products Part 51 Copper strip corrosion test for lubricating greases
48.	IS 1448 (Part 52) : 2017 / ISO 2176 : 1995	Methods of test for petroleum and its products [p : 52] drop point (Second Revision)
49.	IS 1448 (Part 53) : 1979	Methods of test for petroleum and its products [p:53] determination of acidity and alkalinity of greases (First Revision)
50.	IS 1448 (Part 54) : 2017	Methods of test for petroleum and its products [p : 54] determination of phosphorus content - Quinoline phosphomolybdate method (Third Revision)
51.	IS 1448 (Part 55/Sec 1): 2004	Methods of test for petroleum and its products [p: 55/section 1] determination of saponification value of petroleum products (First Revision)
52.	IS 1448 (Part 55/Sec 2) : 2004	Methods of test for petroleum and its products [p : 55/section 2] saponifiable and unsaponifiable matter in oil fat and waxes (First Revision)
53.	IS 1448 (Part 56) : 2013 / ISO 2909: 2002	Methods of test for petroleum and its products [p : 56] calculation of viscosity index from kinematic viscosity (Third Revision)
54.	IS 1448 (Part 57) : 1964	Consistency of greases at various temperatures (P : 57)
55.	IS 1448 (Part 58) : 1991	Methods of test for petroleum and its products [p:58] determination of insolubles in greases (First Revision)
56.	IS 1448 (Part 59) : 1991	Methods of test for petroleum and its products [p:59] determination of mineral oil content in greases (Second Revision)
57.	IS 1448 (Part 60) : 2023 / ISO 2137 : 2020	Methods of test for petroleum and its products Part 60 Consistency of lubricating greases by cone penetrometer
59.	IS 1448 (Part 61) : 2023	Methods of test for petroleum and its products Part 61 Determination of the leakage tendencies of automotive wheel bearing greases
59.	IS 1448 (Part 62) : 2023	Petroleum and its Products - Methods of Test Part 62 heat stability of greases
60.	IS 1448 (Part 62) : 1974	Methods of test for petroleum and its products: heat stability of greases [k62] (First Revision)
61.	IS 1448 (Part 64) : 2023	Petroleum and its Products - Methods of Test Part 64 Non-volatile Matter in Solvents (Second Revision)
62.	IS 1448 (Part 64) : 1998	Methods of test for petroleum and its products [p : 64] non-volatile matter in solvents (First Revision)

63.	IS 1448 (Part 65) : 2018	Methods of test for petroleum and its products [p : 65] oxidation test for lubricating oils (Third Revision)
64.	IS 1448 (Part 66) : 1969	Methods of test for petroleum and its products [p:66] flash point (Open) and fire point by pensky martens apparatus
65.	IS 1448 (Part 67) : 2020 / ISO 6247	Methods of Test for Petroleum and its Products [P : 67] Determination of Foaming Characteristics of Lubricating Oils (Second Revision)
66.	IS 1448 (Part 68) : 2023	Petroleum and its Products - Methods of Test for Part 68 Determination of Evaporation Loss of Lubricating Greases (22 hour drying) (First Revision)
67.	IS 1448 (Part 69) : 2019 / ISO 2592:2017	Methods of Test for Petroleum and its Products [P : 69] Determination of Flash and Fire Points - Cleveland Open Cup Method (Second Revision)
68.	IS 1448 (Part 70) : 2018	Methods of test for petroleum and its products [p : 70] determination of residue in liquefied petroleum gases (First Revision)
69.	IS 1448 (Part 71) : 2004 / ISO 4256	Methods of Test for Petroleum and its Products - Part 71: Liquefied Petroleum Gases - Determination of Gauge Vapour Pressure - LPG Method
70.	IS 1448 (Part 72) : 2023	Methods of test for petroleum and its products Part 72 Method of volatility test of liquified petroleum gases
71.	IS 1448 (Part 73) : 2004 / ISO 8819	Methods of test for petroleum and its products [p: 73] liquefied petroleum gases - Detection of hydrogen sulphide - Lead acetate method (First Revision)
72.	IS 1448 (Part 74) : 2022 / ISO 13758:1996	Methods of test for petroleum and its products Part 74 Liquefied petroleum gases - Assessment of the dryness of propane - Valve freeze method
73.	IS 1448 (Part 76) : 2019 / ISO 3993	Methods of Test for Petroleum and its Products [P : 76] Liquified Petroleum Gases and Light Hydrocarbons - Determination of Density or Relative Density - Pressure Hydrometer Method (First Revision)
74.	IS 1448 (Part 79) : 1992	Methods of test for petrolbium and its products [p:79] determination of trace element in petroleum products - Vanadium (First Revision)
75.	IS 1448 (Part 82) : 2008 / ISO 3830:1993	Methods of test for petroleum and its products:: Part 82 determination of lead content in gasoline - Iodine monochloride method (First Revision)
76.	IS 1448 (Part 84) : 2017	Methods of test for petroleum and its products [P : 84] determination of trace elements in petroleum products - Arsenic (First Revision)
77.	IS 1448 (Part 85) : 2022	Methods of test for petroleum and its products P:85 oil seperation on storage of greases first revision
78.	IS 1448 (Part 86) : 2023	Petroleum and its products - Methods of test part 86 determination of total base number by the potentiometrical perchloric acid titration method (first revision)
79.	IS 1448 (Part 86) : 1977	Methods of test for petroleum and its products (P:86) determination of total base number by potentiometric perchloric acid titration method

80.	IS 1448 (Part 87) : 1979	Methods of test for petroleum and its products [p:87] autoignition temperature of liquid petroleum products
81.	IS 1448 (Part 89) : 2023	Methods of test for petroleum and its products Part 89 Test for thermal stability of lubricating greases
82.	IS 1448 (Part 90) : 2008 ISO 11009:2000	Methods of test for petroleum and its products [p : 90] petroleum products and lubricants - Determination of water washout characteristics of lubricating greases (First Revision)
83.	IS 1448 (Part 91) : 2019 / ISO 6614:1994	Methods of test for petroleum and its products [p : 91] determination of water separability of petroleum oils and synthetic fluids (First Revision)
84.	IS 1448 (Part 93) : 2021	Methods of test for Petroleum and its products P: 93 Determination of needle penetration (First Revision)
85.	IS 1448 (Part 94) : 2019	Methods of test for petroleum and its products [p : 94] test for oxidation stability of lubricating grease by oxygen pressure vessel method (First Revision)
86.	IS 1448 (Part 95) : 2019	Methods of test for petroleum and its products [p : 95] determination of demulsibility characteristics of lubricating oils (First Revision)
87.	IS 1448 (Part 96) : 2019 / ISO 7120: 1987	Methods of test for petroleum and its products [p : 96] petroleum products and lubricants - Petroleum oils and other fluids - Determination of rust - Preventing characteristics in the presence of water (First Revision)
88.	IS 1448 (Part 97) : 2015 / ISO 6249 : 1999	Methods of test for petroleum and its products [p : 97] determination of thermal oxidation stability of gas turbine fuels - JFTOT method (First Revision)
89.	IS 1448 (Part 98) : 1981	Methods of test for petroleum and its products - Part 98 determination of emulsion stability of emulsifiable cutting oils
90.	IS 1448 (Part 99) : 1981	Methods of test for petroleum and its products - Part 99 : determination of frothing characteristics of emulsifiable cutting oils
91.	IS 1448 (Part 100) : 1980	Methods of test for petroleum and its products (P :100)Determination of thermal stability of emulsifiable cutting oils
92.	IS 1448 (Part 101) : 1980	Methods of test for petroleum and its products (P : 101) colorimetric determination of phosphorus in lubricating oils
93.	IS 1448 (Part 102) : 2023	Methods of test for petroleum and its products Part :102 Determination of air release value
94.	IS 1448 (Part 103) : 1981	Methods of test for petroleum and its products [p:103] barium, calcium, phosphorus and zinc in lubricating oils by direct reading emission spectrographic method
95.	IS 1448 (Part 104) : 1981	Method of test for petroleum and its products (P : 104) aromatics in light naphthas and aviation gasolines by gas chromatography
96.	IS 1448 (Part 105) : 1981	Methods of test for petroleum and its products [p:105] ultraviolet (UV) absorbance and absorptivity of petroleum products
97.	IS 1448 (Part 106) : 1981	Methods of test for petroleum and its products [p:106] determination of oxidation characteristics of inhibited steam - Turbine oils

98.	IS 1448 (Part 107) : 1982	Methods of test for petroleum and its products [p: 107] precipitation number of lubricating oils
99.	IS 1448 (Part 109) : 2004 / ISO 3012 : 1999	Methods of test for petroleum and its products [p: 109] petroleum products - Determination of thiol (Mercaptan) sulphur in light and middle distillate fuels - Potentiometric method (First Revision)
100.	IS 1448 (Part 110) : 1981	Methods of test for petroleum and its products [p : 110] cold filter plugging point of distillate fuels
101.	IS 1448 (Part 111) : 1983	Methods of test for petroleum and its products [p:111] analysis of liquefied petroleum gases (LPG) and propylene concentrates by gas chromatography
102.	IS 1448 (Part 112) : 1983	Methods of test for petroleum and its products [p : 112] determination of lead in gasoline by atomic absorption spectrometry
103.	IS 1448 (Part 113) : 1983	Methods of test for petroleum and its products [p:113] Determination of total acidity in aviation turbine fuel
104.	IS 1448 (Part 114) : 2019 / ISO 2207	Methods of test for petroleum and its products [p : 114] petroleum waxes - Determination of congealing point (First Revision)
105.	IS 1448 (Part 115) : 1984	Methods of test for petroleum and its products [p:115] determination of salt content in crude petroleum and its products
106.	IS 1448 (Part 116) : 2018	Methods of test for petroleum and its products [p : 116] determination of cone penetration of lubricating grease using one quarter and one half scale - Cone (Second Revision)
107.	IS 1448 (Part 118) : 2019	Methods of test for petroleum and its products [p : 118] naphthalene hydrocarbons in aviation turbine fuel by ultraviolet spectrophotometry (First Revision)
108.	IS 1448 (Part 119) : 1985	Methods of test for petroleum and its products (P : 119) aromatic traces in light saturated hydrocarbons by gas chromatography
109.	IS 1448 (Part 120) : 2021	Methods of test for petroleum and its products: Part 120 Zinc in lubricating oil
110.	IS 1448 (Part 121) : 2022	Methods of test for petroleum and its products Part 121 Barium lubricating oil additive concentrates
111.	IS 1448 (Part 122) : 2013 / ISO 6615: 1993	Methods of test for petroleum and its products [p : 122] determination of carbon residue - Conradson method (First Revision)
112.	IS 1448 (Part 123) : 2013 / ISO 7624:1997	Methods of test for petroleum and its products [p : 123] inhibited mineral turbine oils - Determination of oxidation stability (First Revision)
113.	IS 1448 (Part 125) : 1987	Methods of test for petroleum and its products [p: 125] estimation of deleterious particles in lubricating grease
114.	IS 1448 (Part 126) : 2023	Methods of test for petroleum and its products:: Part 126 determination of ash content in raw and calcined petroleum coke
115.	IS 1448 (Part 127) : 1988	Methods of test for petroleum and its products [p: 127] determination of iron in petroleum coke
116.	IS 1448 (Part 128) : 2018	Methods of test for petroleum and its products [p : 128] determination of nickel in calcined petroleum coke (First Revision)

117.	IS 1448 (Part 129) : 2018	Methods of test for petroleum and its products [p : 129] determination of polymeric content in lubricating oils base stock (First Revision)
118.	IS 1448 (Part 130) : 2019	Methods of test for petroleum and its products [p : 130] determination of vibrated bulk density of calcined petroleum coke (First Revision)
119.	IS 1448 (Part 131) : 1988	Methods of test for petroleum and its products [p:131] determination of silicon in petroleum coke
120.	IS 1448 (Part 132) : 2018	Methods of Test for Petroleum and its Products: Part 132 Determination of Moisture Content in Raw and Calcined Petroleum Coke
121.	IS 1448 (Part 133) : 2018	Methods of test for petroleum and its products [p : 133] determination of real density of calcined petroleum coke (First Revision)
122.	IS 1448 (Part 134) : 2018	Methods of test for petroleum and its products [p : 134] determination of volatile matter in raw and calcined petroleum coke (First Revision)
123.	IS 1448 (Part 135) : 2013 / ISO 9029:1990	Methods of test for petroleum and its products [p : 135] crude petroleum - Determination of water - Distillation method (First Revision)
124.	IS 1448 (Part 136) : 1991	Methods of test for petroleum and its products [p:136] determination of evaporation loss of lubricating oils (Noacks Method)
125.	IS 1448 (Part 137) : 1991	Methods of test for petroleum and its products [p:137] water separation characteristics of aviation turbine fuels
126.	IS 1448 (Part 138) : 2018	Methods of test for petroleum and its products [p : 138] determination of soap content (First Revision)
127.	IS 1448 (Part 139) : 2018	Methods of test for petroleum and its products [p : 139] determination of real density of calcined petroleum coke using butanol or toluene (First Revision)
128.	IS 1448 (Part 140) : 1992	Methods of test for petroleum and its products [p:140] determination of apparent density of petroleum coke by mercury pyknometer method
129.	IS 1448 (Part 141) : 2018	Methods of test for petroleum and its products [p : 141] determination of apparent density of calcined petroleum coke by helium method (First Revision)
130.	IS 1448 (Part 142) : 2021	Determination of water separation characteristics of aviation turbine fuels by portable separometer
131.	IS 1448 (Part 143) : 2022	Methods of test for petroleum and its products Part 143 Evaluation of white mineral oils by ultraviolet absorption spectroscopy
132.	IS 1448 (Part 144) : 1993	Methods of test for petroleum and its products [p:144] non - Condensable gases in C2 and lighter hydrocarbon products by gas chromatography
133.	IS 1448 (Part 145) : 2022	Methods of test for petroleum and its products Part 145 Determination of sodium nickel and vanadium in fuel oils and crude oils by atomic absorption spectroscopy (first revision)
134.	IS 1448 (Part 146) : 1998	Methods of test for petroleum and its products [p : 146] determination of yield stress and apparent viscosity of engine oils at low temperature
135.	IS 1448 (Part 147) : 1998	Methods of test for petroleum and its products [p : 147] determination of potential gum in motor gasolines

136.	IS 1448 (Part 148) : 2019 / ISO 6297	Methods of test for petroleum and its products [p : 148] petroleum products - Aviation and distillate fuels - Determination of electrical conductivity (First Revision)
137.	IS 1448 (Part 149) : 2020 / ISO 12156-1:2018	Methods of Test for Petroleum and its Products Part 149 Diesel Fuel - Assessment of Lubricity Using the High - Frequency Reciprocating Rig (HFRR) - Test Method (Second Revision)
138.	IS 1448 (Part 150) : 2004 / ISO 13757 : 1996	Methods of test for petroleum and its products [p:150] liquefied petroleum gases - Determination of oily residues - High - Temperature method
139.	IS 1448 (Part 151) : 2004 ISO 7941	Methods of test for petroleum and its products [p: 151] commercial propane and butane - Analysis by gas chromatography
140.	IS 1448 (Part 152) : 2004 / ISO 6251	Methods of test for petroleum and its products [p: 152] liquefied petroleum gases - Corrosiveness to copper - Copper strip test
141.	IS 1448 (Part 153) : 2012 / ISO 20847 : 2004	Methods of test for petroleum and its products [p : 153] petroleum products - Determination of sulfur content of automotive fuels - Energy - Dispersive x - Ray fluorescence spectrometry
142.	IS 1448 (Part 154) : 2012 / ISO 12205 : 1995	Methods of test for petroleum and its products [p : 154] determination of the oxidation stability of middle - Distillate fuels
143.	IS 1448 (Part 155) : 2020	Methods of Test for Petroleum and its Products [P : 155] Determination of Trace Nitrogen in Liquid Petroleum Hydrocarbons by Oxidative Combustion with Chemiluminescence Detector
144.	IS 1448 (Part 157) : 2018	Methods of test for petroleum and its products [p : 157] rust protections by metal preservatives in the humidity cabinet
145.	IS 1448 (Part 158) : 2016 / ISO 5661	Methods of test for petroleum and its products [p : 158] hydrocarbon liquids - Determination of refractive index
146.	IS 1448 (Part 159) : 2018 / ISO 20884	Methods of test for petroleum and its products [p : 159] determination of sulphur content of automotive fuels - Wavelength - Dispersive x - Ray fluorescence spectrometry
147.	IS 1448 (Part 160) : 2017 / ISO 20846	Methods of test for petroleum and its products [p : 160] determination of sulphur content of automotive fuels - Ultraviolet fluorescence method
148.	IS 1448 (Part 161) : 2017 / ISO 13032	Methods of test for petroleum and its products [p : 161] determination of low concentration of sulphur in automotive fuels - Energy - Dispersive x - Ray fluorescence spectrometric method
149.	IS 1448 (Part 162) : 2018	Methods of Test for Petroleum and Its Products [P:162] Determination of insoluble Contamination of Hydraulic Fluids by Gravimetric Analysis
150.	IS 1448 (Part 163) : 2018	Methods of test for petroleum and its products [p : 163] determination of gasoline diluent in used gasoline engine oils by gas chromatography
151.	IS 1448 (Part 164) : 2018	Methods of test for petroleum and its products [p : 164] determination of the leakage tendencies of automotive wheel bearing grease under accelerated conditions
152.	IS 1448 (Part 165) : 2018	Methods of test for petroleum and its products [p : 165] test method for roll stability of lubricating grease

153.	IS 1448 (Part 167) : 2018 / ISO 12185	Methods of test for petroleum and its products [p : 167] determination of density - Oscillating u - Tube method
154.	IS 1448 (Part 168) : 2018 / ISO 13758 : 1996	Methods of Test for Petroleum and its Products [P : 168] Assessment of the Dryness of Propane - Valve Freeze Method
155.	IS 1448 (Part 169) : 2018 / ISO 15597:2001	Methods of test for petroleum and its products [p : 169] determination of chlorine and bromine content - Wavelength - Dispersive x - Ray fluorescence spectrometry
156.	IS 1448 (Part 170) : 2021 / ISO 20623	Methods of test for petroleum and its products Part 170 Petroleum and related products Determination of the extreme pressure and anti-wear properties of lubricants Four-ball method European conditions
157.	IS 1448 (Part 171) : 2019 / ISO 10143 : 2014	Methods of test for petroleum and its products [p : 171] carbonaceous materials for the production of aluminum - Calcined coke for electrodes - Determination of the electrical resistivity of granules
158.	IS 1448 (Part 172) : 2020	Methods of Test for Petroleum and its Products [P : 172] ICP-AES Method for Determination of Trace Elements in Petroleum Products
159.	IS 1448 (Part 173) : 2020	Methods of Test for Petroleum and its Products [P : 173] Determination of Lead Content in Motor Gasoline - Energy Dispersive X-Ray Fluorescence Spectrometry Method
160.	IS 1448 (Part 174) : 2020 / ISO 4264:2018	Methods of Test for Petroleum and its Products Part 174 Petroleum Products - Calculation of Cetane index of Middle-Distillate Fuels by the Four Variable Equation
161.	IS 1448 (Part 175) : 2020 / ISO 6296:2000	Methods of Test for Petroleum and its Products Part 175 Petroleum Products - Determination of Water - Potentiometric Karl Fischer Titration Method
162.	IS 1448 (Part 176) : 2020 / ISO 7537:1997	Methods of Test for Petroleum and its Products Part 176 Petroleum Products - Determination of Acid Number - Semi-micro Colour-indicator Titration Method
163.	IS 1448 (Part 177) : 2020 / ISO 3648:1994	Methods of Test for Petroleum and its Products Part 177 Aviation Fuels Estimation of Net Specific Energy
164.	IS 1448 (Part 178) : 2020 / ISO 6271:2015	Methods of Test for Petroleum and its Products Part 178 Clear Liquids - Estimation of Colour by the platinum Cobalt Colour Scale
165.	IS 1448 (Part 179) : 2020 / ISO 14596:2007	Methods of Test for Petroleum and its Products Part 179 Petroleum Products - Determination of Sulfur Content - Wavelength-dispersive X-ray Fluorescence Spectrometry
166.	IS 1448 (Part 180) : 2020 / ISO 16591:2010	Methods of Test for Petroleum and its Products Part 180 Petroleum Products - Determination of Sulphur Content - Oxidative Microcoulometry Method
166.	IS 1448 (Part 181) : 2020 / ISO 22854:2016	Methods of Test for Petroleum and its Products Part 181 Liquid Petroleum Products - Determination of Hydrocarbon Types and Oxygenates in Automotive Motor Gasoline and in Ethanol (E85) Automotive Fuel - Multidimensional Gas Chromatography Method

168.	IS 1448 (Part 182) : 2020 / ISO 12937:2000	Methods of Test for Petroleum and its Products Part 182 Petroleum Products - Determination of Water - Coulometric Karl Fischer Titration Method
169.	IS 1448 (Part 183) : 2021 / ISO 14935	Methods of test for petroleum and its part 183 Petroleum and related Products -Determination of wick flame persistence of fire-resistant Fluids
170.	IS 1448 (Part 184) : 2021 / ISO 15029-2:2018	Methods of Test for Petroleum and its Products Part 184 petroleum and related products - Determination of spray ignition characteristics of fire-resistant fluids spray test - Stabilised flame heat release method
171.	IS 1448 (Part 185) : 2021 / ISO 20823:2003	Methods of Test for Petroleum and its products part 185 Petroleum and Related Products-Determination of the Flammability characteristics of fluids in Contact with Hot Surfaces-Manifold Ignition Test
172.	IS 1448 (Part 186) : 2021 / ISO 23581:2020	Petroleum Products and Related Products Determination of Kinematic Viscosity Method by Stabinger Type Viscometer
173.	IS 1448 (Part 187) : 2021 / ISO 3987:2010	Methods of test for Petroleum and its Products Part 187 Petroleum Products-Determination of Sulfated Ash in Lubricating Oils and Additives
174.	IS 1448 (Part 188) : 2021 / ISO 6618:1997	Petroleum products and lubricants determination of acid or base number colour-indicator titration method
175.	IS 1448 (Part 189) : 2021 / ISO 10370:2014	Petroleum products - determination of carbon residue - micro method
176.	IS 1448 (Part 190) : 2021 / ISO 15167:1999	Petroleum products determination of particulate content of middle distillate fuels laboratory filtration method
177.	IS 1448 (Part 191) : 2023 / ISO 13737:2004	Methods of test for petroleum and its products Part Determination of low-temperature cone penetration of lubricating greases
178.	IS 1448 (Part 192) : 2023 / ISO 22285 : 2018	Methods of test for petroleum and its products Part Determination of oil separation from grease Pressure filtration method
179.	IS 1448 (Part 193) : 2023 / ISO 22286 : 2018	Methods of test for petroleum and its products Part Determination of the dropping point of grease with an automatic apparatus
180.	IS 1488 (Part 157) : 2018	Methods of test for petroleum and its products [p : 157] rust protections by metal preservatives in the humidity cabinet
181.	IS 7895 : 1975	Tests for fire - Resistant characteristics of hydraulic fluids used in mining machinery
182.	14504 : 2021 /ISO 6976:2016	Natural Gas - Calculation of Calorific Values, Density, Relative Density and Wobbe Indices from Composition (First Revision)
183.	IS 15125 : 2002 /ISO 10715	Natural gas - Sampling guidelines
184.	IS 15128 : 2020 /ISO 10723:2012	Natural Gas - Performance Evaluation for Analytical Systems (First Revision)
185.	IS 15129 : 2002 /ISO 14111	Natural gas - Guidelines to traceability in analysis
186.	IS 15130 (Part 1) : 2019 / ISO 6974-1	Natural Gas - Calculation of Compression Factor Part 1 Introduction and Guidelines (First Revision)

187.	IS 15130 (Part 2) : 2021 / ISO 6974-2:2012	Natural Gas - Determination of Composition and Associated Uncertainty by Gas Chromatography Part 2 Uncertainty Calculations (First Revision)
188.	IS 15130 (Part 3) : 2021 / ISO 6974-3:2018	Natural gas determination of composition and associated uncertainty by gas chromatography part 3: precision and bias
189.	IS 15130 (Part 4) : 2002 / ISO 6974-4	Natural Gas - Determination of Composition with Defined Uncertainty by Gas Chromatography - Part 4 : Determination of Nitrogen, Carbon Dioxide and C1 to C5 and C6+ Hydrocarbons for a Laboratory and On-line Measuring System Using Two Columns
190.	IS 15130 (Part 5) : 2021 / ISO 6974-5	Natural Gas - Determination of Composition with Defined Uncertainty by Gas Chromatography - Part 5 : Determination of Nitrogen Carbon Dioxide and C1 to C5 and C6 Hydrocarbons for a Laboratory and On-line Process Application Using Three Columns
191.	IS 15305 (Part 1) : 2019 / ISO 12213-1	Natural Gas - Calculation of Compression Factor Part 1 Introduction and Guidelines (First Revision)
192.	IS 15305 (Part 2) : 2019 / ISO 12213-2:2006	Natural Gas - Calculation of Compression Factor Part 2 Calculation Using Molar-Composition Analysis (First Revision)
193.	IS 15305 (Part 3) : 2018 / ISO 12213-3	Natural gas - Calculation of compression factor: Part 3 calculation using physical properties (First Revision)
194.	IS 15319 : 2020ISO 13734	Natural Gas - Organic Components Used as Odorants - Requirements and Test Methods (First Revision)
195.	IS 15641 (Part 1) : 2006 / ISO 10101-1	Natural gas - Determination of water by the karl fischer method: Part 1 INtroduction
196.	IS 15641 (Part 2) : 2006 / ISO 10101-2	Natural gas - Determination of water by the karl fischer method: Part 2 titration procedure
197.	IS 15641 (Part 3) : 2007 / ISO 10101 -3	Natural gas - Determination of water by karl fischer method: Part 3 coulometric procedure
198.	IS 17315 (Part 1) : 2019 / ISO 4259-1	Petroleum and Related Products - Precision of Measurement Methods and Results Part 1 Determination of Precision Data in Relation to Methods of Test
199.	IS 17315 (Part 2) : 2019 / ISO 4259-2	Petroleum and Related Products - Precision of Measurement Methods and Results Part 2 Interpretation and Application of Precision Data in Relation to Methods of Test



PETROLEUM AND RELATED PRODUCTS AND METHODS

- Petroleum and their Related Products of Synthesis or Biological Origin sectional committee, PCD 3 is one of the 15 sectional committees working under PCDC with the scope “To formulate Indian Standards for terminology; petroleum, petroleum products, biofuels (liquid and gas), fuels produced through synthesis route, specification for natural gas and codes of practice for storage, handling, transport and application.”.
- This committee has formulated total **68** standards. Complete list of standards formulated by this committee has been placed below.

S No.	IS No.	Title
1.	IS 534 : 2021	Benzene
2.	IS 537 : 2011	Toluene - Specification (Second Revision)
3.	IS 1459 : 2018	Kerosene - Specification (Fourth Revision)
4.	IS 1460 : 2017	Automotive diesel fuel - Specification (Sixth Revision)
5.	IS 1571 : 2018	Aviation turbine fuels, kerosine type, jet - A - 1 - Specification (Tenth Revision)
6.	IS 1587 : 2017	Aviation turbine fuel, high flash point type - Specification (Fourth Revision)
7.	IS 1593 : 2018	Fuel oils - Specification (Third Revision)
8.	IS 1604 : 2022	Aviation gasoline - Specification (fifth revision)
9.	IS 1745 : 2018	Petroleum hydrocarbon solvents - Specification (Third Revision)
10.	IS 2796 : 2017	Motor gasoline - Specification (Sixth Revision)
11.	IS 3470 : 2017	Hexane, food grade - Specification (Second Revision)
12.	IS 4576 : 2021	Liquefied Petroleum Gases-Specification
13.	IS 4639 (Part 1) : 2000 / ISO 1998-1	Petroleum industry - Terminology: Part 1 raw materials and products (First Revision)
14.	IS 4639 (Part 2) : 2000 / ISO 1998-2	Petroleum industry - Terminology: Part 2 properties and tests (First Revision)
15.	IS 4639 (Part 3) : 2000 / ISO 1998-3	Petroleum industry - Terminology: Part 3 exploration and production (First Revision)
16.	IS 4639 (Part 4) : 2000 / ISO 1998-4	Petroleum industry - Terminology: Part 4 refining (First Revision)
17.	IS 4639 (Part 5) : 2000 / ISO 1998-5	Petroleum industry - Terminology: Part 5 transport, storage, distribution (First Revision)
18.	IS 4639 (Part 6) : 2002 / ISO 1998-6	Petroleum industry - Terminology: Part 6 measurement (First Revision)
19.	IS 4639 (Part 7) : 2000 / ISO 1998-7	Petroleum industry - Terminology: Part 7 miscellaneous terms (First Revision)
20.	IS 4639 (Part 99) : 2002 / ISO 1998-99	Petroleum industry - Terminology: Part 99 general and index (First Revision)
21.	IS 4654 : 2019	Paraffin Wax — Specification (Third Revision)

22.	IS/ISO 8216-1 : 2010 / ISO 8216-1	Petroleum products - Fuels (Class F) classification: Part 1 categories of marine fuels
23.	IS 8502 : 2018	Petroleum coke - Specification (Second Revision)
24.	IS 11254 : 2009	Code of practice for dispensation of aviation fuel and allied products (First Revision)
25.	IS 11489 : 1985	Specification for heavy petroleum stock (HPS)
26.	IS 13833 : 2019	Microcrystalline Wax Derived From Petroleum — Specification (First Revision)
27.	IS 14861 : 2000	Liquefied petroleum gases (LPG) for automotive purposes - Specification
28.	IS 15126 : 2002ISO 13443	Natural gas - Standard reference conditions
29.	IS 15127 : 2002ISO 13686	Natural gas - Quality designation
30.	IS 15217 : 2002	Fuel oil for diesel generating sets - Specification
31.	IS 15320 (Part 1) : 2012 / ISO 15403-1 : 2006	Natural gas - Natural gas for use as a compressed fuel for vehicles: Part 1 designation of the quality (First Revision)
32.	IS 15464 : 2022	Anhydrous ethanol for use as blending component in motor gasoline specification (First Revision)
33.	IS 15607 : 2022	Biodiesel B-100 - Fatty Acid Methyl Esters FAME Specification Second Revision
34.	IS 15770 : 2008	Light diesel oil - Specification
35.	IS 15770 : 2021	Heating Oil (LDO) - Specification
36.	IS 15958 : 2012	Compressed natural gas (CNG) for automotive purposes - Specification
37.	IS 16061 : 2021 / ISO 14687 : 2019	Hydrogen Fuel Quality Product Specification
38.	IS 16087 : 2016	Biogas (Biomethane) - Specification (First Revision)
39.	IS 16531 : 2022	Biodiesel Diesel Fuel Blend B8 to B20 Specification First Revision of IS 16531
40.	IS 16629 : 2017	Hydrous ethanol for use in ed 95 automotive fuel - Specification
41.	IS 16634 : 2017	E85 fuel (Blend Of Anhydrous Ethanol And Gasoline) - Specification
42.	IS 16704 : 2018 ISO 16861	Petroleum products - Fuels (Class F) - Specifications of dimethyl ether (DME)
43.	IS 16731 : 2019 8217 : 2017	Petroleum products - Fuels (Class F) - Specifications of marine fuels
44.	IS 16737 : 2018 ISO 8216-2 :1986	Petroleum Products- Fuels (Class F) - Classification Part 2 Categories of Gas Turbine Fuels for Industrial and Marine Applications
45.	IS 16737 (Part 3) : 2018 / ISO 8216-3 : 1987	Petroleum products - Fuels (Class F) - Classification: Part 3 family 1 (Liquefied Petroleum Gases)
46.	IS 16737 (Part 99) : 2017 / ISO 8216-99 : 2002	Petroleum products - Fuels (Class F) - Classification: Part 99 general

47.	IS 16861 : 2018	High flash high speed diesel fuel - Specification
48.	IS 17021 : 2018	E 20 fuel - Admixture of anhydrous ethanol and gasoline - As fuel for spark ignited engine powered vehicles - Specification
49.	IS 17042 (Part 1) : 2020 / ISO 22241-1:2019	Diesel Engines — NOx Reduction Agent AUS 32 Part 1 Quality Requirements (First Revision)
50.	IS 17042 (Part 2) : 2020 / ISO 22241-2:2019	Diesel Engines — NOx Reduction Agent Aus 32 Part 2 Test Methods (First Revision)
51.	IS 17042 (Part 3) : 2018 / ISO 22241-3	Diesel Engines - NOX Reduction Agent AUS 32 Part 3 Handling, Transportation and Storage
52.	IS 17049 : 2018	Petroleum coke for anode making in aluminium industry - Specification
53.	IS 17075 : 2019	Anhydrous methanol for use as a blending component in fuels - Specification
54.	IS 17076 : 2019	M15 fuel - Admixture of anhydrous methanol and motor gasoline as fuel for spark ignited engines - Specification
55.	IS 17081 : 2019	Aviation turbine fuel (Kerosene Type, Jet A - 1) containing synthesized hydrocarbons - Specification
56.	IS 17314 : 2019	Hydrogen Enriched Compressed Natural Gas (HCNG) for Automotive Purposes Specification
57.	IS 17586 : 2021	E12 and E15 Fuel - Admixture of Anhydrous Ethanol and Motor Gasoline - For Positive Ignition Engine Powered Vehicles - Specification
58.	IS 17661 (Part 1) : 2022 / ISO 18611-1:2014	Ships and marine technology Marine NOX Reduction Agent AUS 40 Part 1: Quality Requirements
59.	IS 17661 (Part 2) : 2022 / ISO 18611-2:2014	Ships and marine technology Marine NOX Reduction Agent AUS 40 Part 2: Test Methods
60.	IS 17661 (Part 3) : 2022 / ISO 18611-3:2014	Ships and marine technology Marine NOX Reduction Agent AUS 40 Part 3: Handling transportation and storage
61.	IS 17789 : 2022	Gas oil - Specification
62.	IS 17792 : 2022	Vacuum gas oil VGO - Specification
63.	IS 17793 : 2022	Kerosene Intermediate - Specification
64.	IS 17794 : 2022	Petroleum naphtha - Specification
65.	IS 17821 : 2022	Ethanol as a fuel for use in positive ignition engine powered vehicles specification
66.	IS 17943 : 2022	E20 Reference Fuel Admixture of Anhydrous Ethanol and Motor Gasoline Specification
67.	IS 18247 : 2023 ISO 23306 : 2020	Liquefied natural gas as a fuel for marine applications - Specification
68.	IS/ISO/PAS 22263 : 2019 ISO/PAS 23263	Petroleum Products Fuels (class F) Considerations for Fuel Suppliers and Users Regarding Marine Fuel Quality in View of the Implementation of Maximum 0.50% Sulfur in 2020



FEW IMPORTANT PETROLEUM PRODUCT STANDARDS

IS 2796:2017– MOTOR GASOLINE SPECIFICATION

Motor Gasoline (earlier also known as Motor Spirit) is a complex mixture composed of relatively volatile hydrocarbons that vary widely in their physical and chemical properties. Motor Gasoline (MG) is exposed to a wide variety of mechanical, physical and chemical environments. Thus, the properties of motor gasoline must be balanced to give satisfactory engine performance over an extremely wide range of operating conditions. The performance of motor gasoline in spark ignition engines depends on a number of factors like engine design, engine maintenance, driving cycle, environment and fuel quality parameters like octane number, volatility, stability, etc.

SCOPE OF THE STANDARD

This standard prescribes the requirements and methods of sampling and test methods for two octane grades each of Motor Gasoline (earlier also known as Motor Spirit) and up to 10 percent ethanol blended motor gasoline (E10) under each of BS IV and BS VI categories suitable for use as a fuel in the automobile spark-ignition internal combustion engines of vehicles complying with BS IV and BS VI emission norms respectively.

This standard also applies to blends of motor gasoline with organic oxygenates such as alcohols and ethers.

GRADES

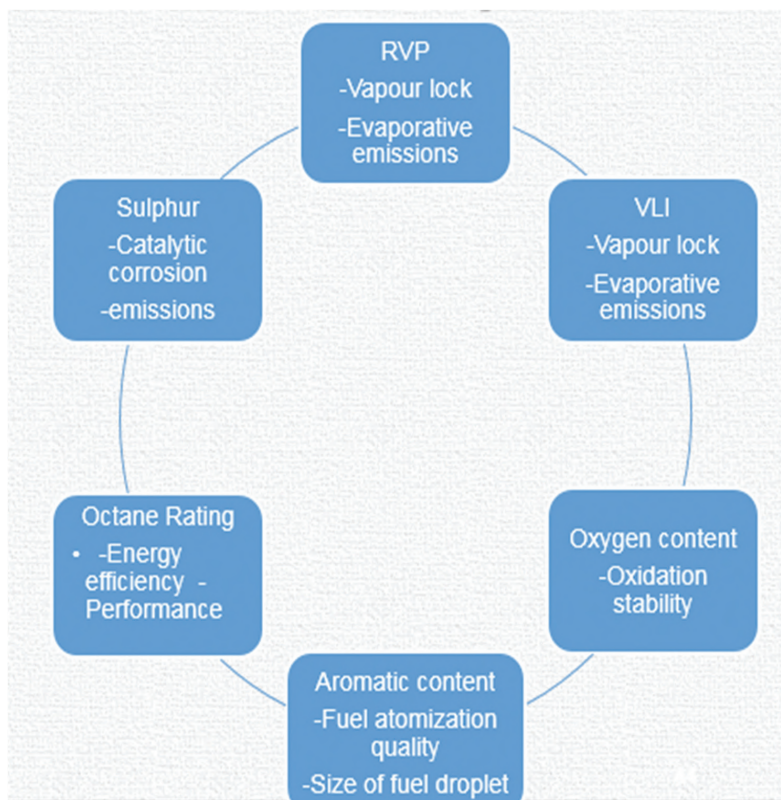
There are two octane grades each (RON 91 and 95) of BS IV and BS VI categories under motor gasoline and 10 percent ethanol blended motor gasoline (E10) as given below:

Motor Gasoline (Without or with 5 Percent Ethanol Blended Motor Gasoline)

- a) BS IV Regular (RON 91),
- b) BS IV Premium (RON 95),
- c) BS VI Regular (RON 91), and
- d) BS VI Premium (RON 95).

10 Percent Ethanol Blended Motor Gasoline (EBMG)

- a) 10 percent EBMGBS IV Regular (RON 91),
- b) 10 percent EBMG BS IV Premium (RON 95),
- c) 10 percent EBMGBS VI Regular (RON 91), and
- d) 10 percent EBMG BS VI Premium (RON 95).





CRITICAL REQUIREMENTS

IS 2796 : 2017

Table 1 Requirement for Motor Gasoline BS-IV & BS-VI Grades

(Clauses 4.1.4, 4.2.2 and 4.4)

SI No.	Characteristic	Requirements MG BS IV Grade	Requirements MG BS VI Grade	Method of Test, IS 1448 / Annex of IS 2796 / ISO / ASTM Alternate Methods
(1)	(2)	(3)	(4)	(5)
i)	Appearance	Clear and bright. Free from un-dissolved water, foreign matter and other visible impurities	Clear and bright. Free from un-dissolved water, foreign matter and other visible impurities	Visual
ii)	Colour:			Visual
	a) MG 91	Orange	Orange	
	b) MG 95	Red	Red	
iii)	Density at 15°C, kg/m ³	720-775	720-775	[P:16] ⁹⁾ / ISO 3675 / ASTM D 4052/ISO 12185/ ASTM D 1298 / IP 160
iv)	Distillation:			[P:18] ⁹⁾ / ISO 3405 / ASTM D 86
	a) percent evaporated at 70°C (E 70°C), percent v/v:			
	1) Motor gasoline	10-45	10-45	
		10-55 (Summer)	10-55 (Summer)	(See Note 1)
	2) E10	10-58 (Other months)	10-58 (Other months)	
	b) percent evaporated at 100°C (E 100 °C), percent v/v	40-70	40-70	
	c) percent evaporated at 150°C (E 150 °C), percent v/v, Min	75	75	
	d) Final boiling point, °C, Max	210	210	
	e) Residue, percent by volume, Max	2.0	2.0	
v)	Research octane number (RON), Min:			[P:27] ⁹⁾ / ASTM D 2699
	a) MG 91	91	91	
	b) MG 95	95	95	
vi)	Motor octane number (MON), Min:			[P: 26] ⁹⁾ / ASTM D 2700
	a) MG 91	81	81	
	b) MG 95	85	85	
vii)	Gum content (Solvent washed), g/m ³ , Max	40	40	[P : 29] ⁹⁾ / ASTM D 381
viii)	Total sulphur, mg/kg, Max	50	10	P: 34 / P: 153/ ISO 20847/ISO 20846 ⁹⁾ / ISO 13032 ⁹⁾ / ASTM D 2622/ D 3120/ D 5453/ D 7220
ix)	Lead content (as Pb), g/l, Max	0.005	0.005	ASTM D 5059 ⁹⁾ / IP 224
x)	Reid vapour pressure (RVP) at 38°C, kPa , Max:			P : 39 / ASTM D 323 (wet methods) / D 5191(dry method)/ D 6378/ EN 13016/ [Annex A] ⁹⁾ (dry method) (see Note 2)
	a) MG(without ethanol)	60	60	
	b) Ethanol blended MG	67	67	
xi)	Vapour lock index (VLI),Max	Summer / (Other months)	Summer / (Other months)	(see Note 1),
	a) MG (without ethanol)	750 / (950)	750 / (950)	
	b) MG (with 5 percent v/v ethanol)	900 / (1050)	900 / (1050)	Calculation : VLI = 10 x RVP + 7 x E 70°C
	c) E10	1050 / (1100)	1050 / (1100)	
xii)	Benzene content, percent by volume, Max	1	1	ASTM D 3606 (see Note 3) / ASTM D 5580 ⁹⁾ / D 6277 / D 6730/ D 6839/ ISO 22854
xiii)	Copper strip corrosion, for 3 h at 50°C, Max	Not more than No. 1	Not more than No. 1	[P:15] ⁹⁾ / ASTM D130
xiv)	Water tolerance of motor gasoline-alcohol blends, temperature for phase separation:			Annex-B
	a) Winter, °C, Max	0	0	
	b) Other months, °C, Max	10	10	(see Note 4)



Table 1 — (Concluded)

(1)	(2)	(3)	(4)	(5)
xv)	Engine intake system cleanliness	Report MFA used	Report MFA used	(see Note 5)
xvi)	Olefin content, percent by volume, <i>Max</i> :			[P: 23] ⁹⁾ / ASTM D 1319 / D 6730 / D 6839 / ISO 22854
	a) MG 91	21	21	
	b) MG 95	18	18	
xvii)	Oxidation stability, minutes, <i>Mfin</i>	360	360	[P:28] ⁹⁾ / ASTM D 525 / IP 40
xviii)	Aromatics content, percent by volume, <i>Max</i>	35 ⁹⁾	35 ⁹⁾	[P:23] ⁹⁾ / ASTM D 1319 / D 5580 / D 6730 / D 6839 / ISO 22854
xix)	Oxygen content, percent by mass, <i>Max</i>	3.7	3.7	EN 1601 / IP 408 / ASTM D 4815 ⁹⁾ / D 5599 / D 6839
xx)	Ethanol content, percent by volume:			(See Notes 7 and 8)
	a) Motor gasoline	5.0	5.0	ASTM D 4815 ⁹⁾ / D 5599 / Annex C (Water extraction)
	b) E10	10.0	10.0	
xxi)	Oxygenates percent by volume, <i>Max</i>			ASTM D 4815
	a) Ethers containing 5 or more 'C' atoms per molecules such as MTBE, ETBE or TAME	15	15	
	b) Any other oxygenates	Not permitted	Not permitted	

NOTES

1 Summer shall be the period from April to July.

2 For the motor gasoline-alcohol blends, the dry vapour test method given in Annex A shall be followed.

3 It is applicable only for non-alcoholic motor gasoline.

4 In winter (Nov to Feb) it is expected that temperature may be lower than 0°C in the northern hilly region and hence phase separation shall not take place till -10 °C

IS 17021:2018 E 20 FUEL - ADMIXTURE OF ANHYDROUS ETHANOL AND GASOLINE - AS FUEL FOR SPARK IGNITED ENGINE POWERED VEHICLES - SPECIFICATION

SCOPE OF THE STANDARD

This standard prescribes requirements, methods of sampling and test methods for two octane grades of E20 fuel, an admixture of anhydrous ethanol meeting IS 15464 at 20 percent by volume and ethanol free Motor Gasoline meeting IS 2796 at 80 percent volume, under each of BS IV and BS VI categories suitable for use as a fuel in the automobile spark-ignition internal combustion engines of vehicles complying with BS IV and BS VI emission norms respectively.

GRADES

There are two octane grades each (RON 95 and 98) of BS IV and BS VI categories in 20 percent ethanol blended motor gasoline (EBMG), E20 fuel as given below:

- 20 percent EBMG BS IV Regular (RON 95);
- 20 percent EBMG BS IV Premium (RON 98);
- 20 percent EBMG BS VI Regular (RON 95); and
- 20 percent EBMG BS VI Premium (RON 98)



REQUIREMENT FOR 20 PERCENT ETHANOL BLENDED MOTOR GASOLINE

Sl. No. (1)	Characteristics (2)	Requirements MG BS IV Grade (3)	MG BS VI Grade (4)	Ref to Test Method as part of IS 1448/ASTM/ISO/EN (5)
i)	Appearance	Clear and Bright, Free from un-dissolved water, foreign matter and other visual impurities	Clear nad Bright, Free from un-dissolved water, foreign matter and other visual impurities	Visual
ii)	Color	Red (MG 95) Green (MG 98)	Red (MG 95) Green (MG 98)	Visual Inspection
iii)	Density at 15°C, kg/m ³	720-775	720-775	[P: 16] ISO 12185/ ASTM D 4052 / D 1298 / IP 160
iv)	Distillation a) percent evaporated at 70°C (E70°C), percent v/v b) percent evaporated at 100°C (E100°C), percent v/v c) percent evaporated at 150°C (E150°C), percent v/v <i>Min</i> d) Final Boiling Point, °C <i>Max</i> e) Residue, percent by volume, <i>Max</i>	10 - 55 (Summer) 45 - 78 85 210 2.0	10 - 55 (Summer) 45 - 78 85 210 2.0	[P: 18] ISO 3405/ ASTM D 86
v)	Research Octane Number (RON), <i>Min</i>	95 (MG 95)	95 (MG 95)	[P: 27] ASTM D 2699
vi)	Motor Octane Number (MON) <i>Min</i>	83 (MG 95) 86 (MG 98)	83 (MG 95) 86 (MG 98)	[P: 26] ASTM D 2700
vii)	Gum content (Solvent washed), g/m ³ <i>Max</i>	40	40	[P: 29] ASTM D 381
viii)	Total Sulphur, mg/kg, <i>Max</i>	50	10	ASTM D 2622 / D 5453/ D3120/ D 7039 / D7220
ix)	Lead Content (as Pb), g/l, <i>Max</i>	0.005	0.005	IP: 224/ASTM D 5059 / D 3237
x)	Reid Vapour pressure at 38°C, kPa, <i>Max</i>	70	70	ASTM D 5191 (Dry method)/ EN 13016 / Annex A (Dry method)/ D 4953 (see Note 1)
xi)	Vapour Lock Index (VLI), <i>Max</i> a) Summer b) Other Months	1050 1100	1050 100	Calculation (VLI=10 RVP + 7E 70),
xii)	Benzene content, percent by	1	1	ASTM D 5580 / D 6277 / D 6730/ D 3606 / D 6839 / ISO 22854
xiii)	Copper strip corrosion (3 h at 50°C) <i>Max</i>	Class 1	Class 1	[P: 15] / D 130
xiv)	Water tolerance of gasoline-alcohol blends, temperature for phase separation, °C, <i>Max</i> a) other months b) Winter	10 0	10 0	Annex B
xv)	Engine intake system cleanliness	Report - MFA Used	Report - MFA Used	

METHOD FOR VAPOUR PRESSURE OF GASOLINE-ALCOHOL BLEND (DRY METHOD)

Vapour pressure test is specific requirement of following products:

IS 17021:2018 E 20 Fuel - Admixture of anhydrous Ethanol and Gasoline -as fuel for spark ignited engine (70 kPa at 37.8° C)

IS 17943: 2022 E20 Reference Fuel — Admixture of Anhydrous Ethanol and Motor Gasoline (60 - 65 kPa at 37.8° C)

IS 17586: 2021 E12 and E15 Fuel — Admixture of Anhydrous Ethanol and Motor Gasoline — For Positive Ignition Engine Powered Vehicles (68 kPa at 37.8° C)

SUMMARY OF THE METHOD

- This test method covers the determination of the absolute vapour pressure of gasoline and gasoline-oxygenate blends.
- The fuel chamber of the vapour pressure apparatus is filled with the chilled sample and connected to the air chamber at 37.8° C. The apparatus is immersed in a bath at 37.8° C and is shaken periodically until a constant pressure is observed on the gauge attached to the apparatus. The gauge reading, suitably corrected, is reported as the vapour pressure.

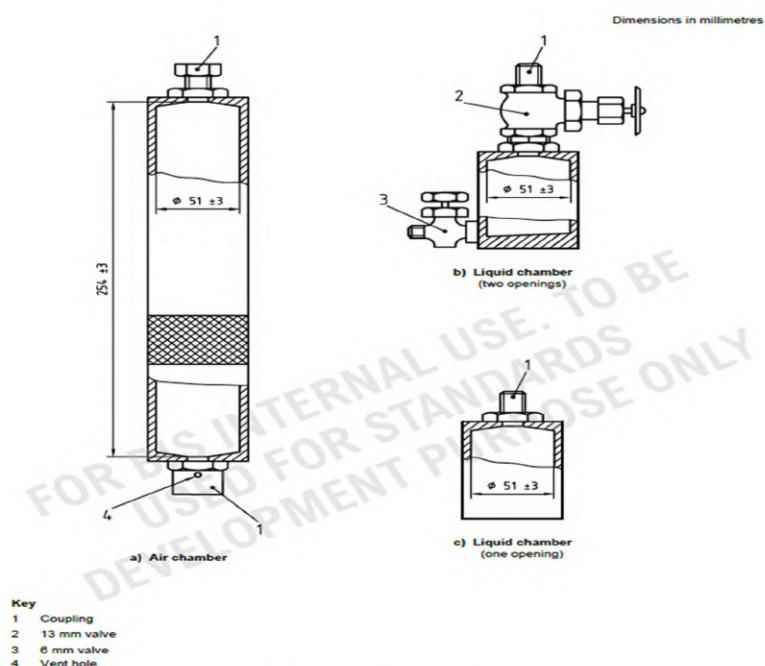


Figure A.1 — Reid vapour-pressure apparatus

HANDLING OF SAMPLES

- The extreme sensitivity of vapour pressure measurements to losses through evaporation and the resulting changes in composition, require the utmost precaution and the most meticulous care in the handling of samples. This is applicable to all samples for vapour pressure determinations.



The size of the sample container from which the vapour pressure sample is taken as 1 l. It will be 70 to 80 percent filled with the sample.

PRECAUTIONS

- Determine vapour pressure as the first test run on a sample. Do not withdraw more than one sample from the sample container for this test.
- Protect samples from excessive heat prior to testing.
- Do not test samples in leaky containers. Discard them and obtain new samples.
- Discard samples that have separated into two phases and obtain new samples.

Sample Handling Temperature

- In all case, cool the sample container and contents to 0 to 1°C before the container is opened. To ensure sufficient time to reach this temperature, directly measure the temperature of a similar liquid in a like container placed in the cooling bath at the same time as the sample.

PREPARATION FOR TEST

Verification of Sample Container Filling

- With the sample at a temperature of 0 to 1°C, take the container from the cooling bath, wipe dry with an absorbent material, unseal it, and examine its ullage. The sample content, as determined by use of a suitable gauge, must be equal to 70 to 80 percent of the container capacity.
- Discard the sample if its volume is less than 70 percent of the container capacity. If the container is more than 80 percent full, pour out enough sample to bring the container contents within the 70 to 80 percent range. Under no circumstances, may any sample poured out, be returned to the container.

Air Saturation of Sample in Sample Container

- With the sample again at a temperature of 0 to 1°C take the container from the cooling bath, wipe it dry with an absorbent material, unseal it momentarily, taking care to prevent water entry, reseal it, and shake it vigorously. Return it to the bath for a minimum of 2 min. Repeat twice more. Return the sample to the bath and keep it there until the beginning of the procedure.

Preparation of Fuel Chamber

- Store the stoppered fuel chamber and the sample transfer connection in a refrigerator or ice-water bath for a sufficient time to allow the chamber and the connection to reach a temperature of 0 to 1°C. If an ice-water bath is used, keep the chamber upright and not immersed over the top of the coupling threads. The transfer connection is inserted over the top of the coupling threads. The transfer connection is inserted into a plastic bag to keep it completely dry during cooling.

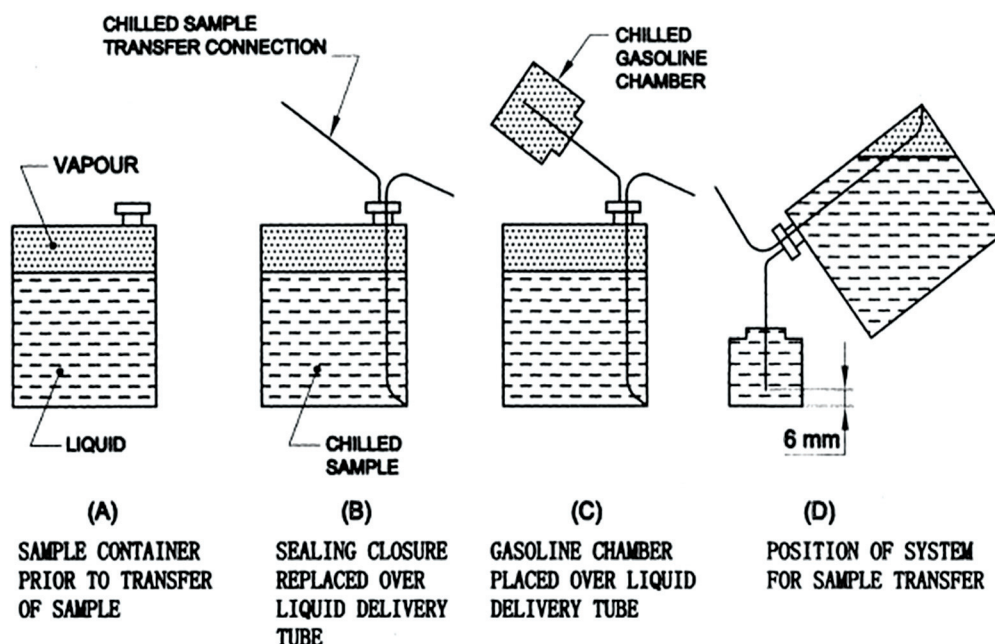
Preparation of Air Chamber

- Connect the gauge to the air chamber and close the lower opening securely with a dry No. 6 rubber stopper. Make sure the stopper is inserted far enough to securely close the vent hole in the air chamber connection. Immerse the air chamber to at least 25 mm above its top in the water bath until the fuel chamber has been filled with the sample.

PROCEDURE

Sample Transfer

- With everything in readings, remove the chilled sample container from the bath, dry it with absorbent material, uncap it, and dry and insert the chilled transfer apparatus. Quickly place the chilled fuel chamber, in an inverted position, over the sample delivery tube of the transfer apparatus. Invert the entire system rapidly so that the fuel chamber is upright, with the end of the delivery tube touching the bottom of the fuel chamber. Fill the fuel chamber to the overflowing. Withdraw the delivery tube from the fuel chamber while allowing the sample to continue flowing up to the moment of complete withdrawal.



Simplified Sketches Outlining Method of Transferring Samples to Gasoline Chamber From Open-Type Containers

Caution

- Make provision for suitable collection and disposal of the overflowing fuel to avoid fire hazard.
- Assembly of Apparatus
- Immediately remove the air chamber from the water bath and immediately dry the exterior of the chamber with absorbent material giving particular care to the connection between the air chamber and the fuel chamber. Remove the stopper after drying and immediately couple the two chambers. Not more than 10 s shall be consumed in coupling the two chambers.

Introduction of Apparatus into Bath

Turn the assembled vapour pressure apparatus upside down to allow the sample in the fuel chamber to run into the air chamber. With the apparatus still inverted, shake it vigorously eight times in a direction parallel to the length of the apparatus. With the gauge end up, immerse the assembled apparatus in the bath, maintained at $37.8 \pm 0.1^\circ\text{C}$ in an inclined position so that the connection of the fuel and air chambers is below the water level and may be carefully examined for leaks 25 mm above the top of the air chamber. Observe the apparatus for leakage throughout the test. Discard the test at any time a leak is detected.



Measurement of Vapour Pressure

- After the assembled vapour pressure apparatus has been immersed in the bath for at least 5 min, tap the pressure gauge lightly and observe the reading. Withdraw the apparatus from the bath and repeat again
- At intervals of not less than 2 min, perform the test until a total of not less than five shakings and gauge readings have been made continue thereafter, if necessary, until the last two consecutive gauge readings are constant, indicating equilibrium attainment.

These operations normally require 20 to 30 min. Read the final gauge pressure to the nearest 0.25 kPa for gauges with intermediate graduations of 0.5 kPa or less than to the nearest 0.5 kPa for gauges with graduations of 1.0 to 2.5 kPa and record the values as the 'uncorrected vapour pressure' of the sample. Without undue delay remove the pressure gauge and, without attempting to remove any liquid which may be trapped in the gauge, check its reading against that of the manometer while both are subjected to a common steady pressure which is no more than 1.0 kPa different from the recorded 'uncorrected vapour pressure'. If a difference is observed between the gauge and manometer readings, the difference shall be added to or subtracted from the 'uncorrected vapour pressure' recorded for the sample being tested, and the resulting value shall be recorded as the vapour pressure of the sample.

Preparation of Apparatus for Next Test

- Thoroughly purge the air chamber of residual sample by filling it with warm water above 32°C and allowing it to drain. Repeat the purging atleast five times. After disconnecting the pressure gauge from its manifold connection with the manometer, remove trapped centrifugal thrusts. This may be accomplished in the following manner: hold the gauge between the palms of the hands with the right hand on the face side and the threaded connection of the gauge forward. Extend the arms forward and upward at an angle of 45° with the coupling of the gauge pointing in the same direction. Swing the arms downward through an arc of about 135° so that the centrifugal force aids gravity in removing the trapped liquid. Repeat this operation three times to expel all liquid. Purge the pressure gauge by directing a small jet of air into its Bourdon tube for atleast 5 min. Rinse both chambers and the sample transfer connection several times with petroleum naphtha, then several times with acetone, then blow dry using dried air. Stopper the fuel chamber and place it in the refrigerator or ice-water bath for the next test.

Precautions

Gross errors can be obtained in vapour pressure measurements, if the prescribed procedure is not followed carefully. The following list emphasizes the importance of strict adherence to the precautions given in the procedure.

- Checking the Pressure Gauge
- Check all gauges against a manometer after each test in order to ensure high precision of results. Read all gauges while the gauges are in a vertical position and after tapping them lightly.
- Shake the container vigorously to ensure equilibrium of the sample with the air in the container
- Checking for leaks
- Check the apparatus before and during each test for both liquid and vapour leaks.

Sampling

- Because initial sampling and the handling of samples will greatly affect the final results, employ the utmost

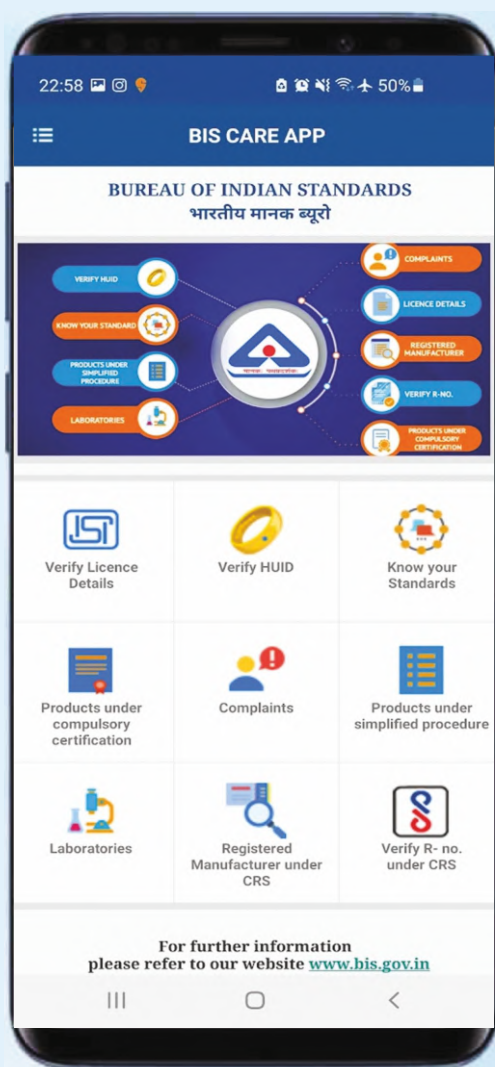


precaution and the most meticulous care to avoid losses through evaporation and even slight changes in composition. In no case shall any part of the apparatus itself be used as the sample container prior to actually conducting the test.

- Purging the Apparatus
- Thoroughly purge the pressure gauge, the fuel chamber and the air chamber to be sure they are free of residual sample. [This is most conveniently done at the end of the previous test] It is important to remove all water from the apparatus before cooling the gasoline chambers and heating the air chamber. In high-humidity conditions be alert for and avoid condensation on the transfer connection and interior walls of the apparatus.

REPORTING OF RESULTS

Report to the nearest 0.25 kPa or 0.5 kPa the gauge result, after correcting for any difference between the gauge and manometer, as the vapour pressure in kilopascals without reference to temperature.



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