



मंगलूर रिफाइनरी और पेट्रोकेमिकल्स लिमिटेड
MANGALORE REFINERY AND PETROCHEMICALS LIMITED

भारतीय मानक ब्यूरो (बीआईएस)
वर्ष 2021 के लिए पेट्रोलियम उत्पादों के लिए विशिष्टता
BUREAU OF INDIAN STANDARDS (BIS)
SPECIFICATION FOR PETROLEUM PRODUCTS FOR YEAR 2021

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क्रमांक S. No	उत्पाद का नाम Product Name	विशिष्टता संख्या और पुनरावृत्ति विवरण Specification Number and Revision Details
1	Liquefied Petroleum Gases (LPG)	IS 4576:2021, 4 th Revision
2	Motor Gasoline – MG 91 Bharat Stage BS VI	IS 2796:2017, 6 th Revision, Amendment No. 02, Jan'20
3	Aviation Turbine Fuels, (ATF) Kerosene Type, JET A-1	IS 1571:2018, 10 th Revision, Amendment No.2, Dec'19.
4	Kerosene Grade A: Low Sulphur Kerosene	IS 1459:2018, 4 th Revision
5	Automotive Diesel Fuel – Bharat Stage BS VI	IS 1460:2017, 6 th Revision, Amendment No. 01, Sept'18
6	High Flash High Speed Diesel (HFHSD)	IS 16861:2018, Amendment No.1, Sept'18
7	Fuel Oil- MV2 Grade	IS 1593:2018, 3 rd Revision
8	Paving Bitumen -VG 30	IS 73:2013, 4 th Revision, (Reaffirmed 2018) Amendment No.1, April '19
9	Paving Bitumen -VG 40	IS 73:2013, 4 th Revision, (Reaffirmed 2018) Amendment No.1, April '19

Date of review: 15.06.2021

**SPECIFICATION FOR LIQUEFIED PETROLEUM GAS
(Commercial Butane-Propane Mixture)
IS 4576:2021**

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Density@ 15°C,kg/ m ³	IP 432	-	Report
2	Vapour pressure at 40°C,kPa	IP 432	Min-Max	520-1050
3	Composition (Liquid Volume Percentage)	ASTM D2163	-	
	a)C2 Hydrocarbons			Report
	b)C3 Hydrocarbons			Report
	c)C4 Hydrocarbons			Report
	d)C5 Hydrocarbons & Heavier OR		Max	2.5
4	Volatility: Evaporation temperature in °C for 95 percent by volume at 760 mm Hg pressure, °C	IS 1448 P:72	Max	2.2
5	Total Volatile Sulphur, mg/kg	ASTM D6667	Max	140
6	Copper Strip Corrosion @ 40°C, for 1hour.	IS 1448 P:152	-	Not worse than No. 1
7	Hydrogen Sulfide	IS 1448 P:73	-	Pass
8	Free water Content	IS 4576:2021 Note:9	-	None
9	Caustic Test	IS 4576:2021 Note:11	-	Pass

SPECIFICATION FOR MOTOR GASOLINE (REGULAR)
BHARAT STAGE VI (MG 91)
IS 2796:2017

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Appearance	Visual	-	Clear and bright, Free from un-dissolved water, foreign matter and other visible impurities.
2	Color	Visual	-	Orange
3	Density at 15°,kg/m ³	ASTM D4052	Min-Max	720-775
4	Distillation	IS 1448 P:18	Min-Max	10.0-45.0
	a) Percent evaporated at 70°C (E70°C), percent v/v		Min-Max	40.0-70.0
	b) Percent evaporated at 100°C (E100°C), percent v/v		Min	75.0
	c) Percent evaporated at 150°C (E150°C), percent v/v		Max	210.0
	d) Final Boiling Point, °C		Max	2.0
e) Residue, percent volume				
5	Research octane number (RON)	IS 1448 P:27	Min	91.0
6	Motor octane number (MON)	IS 1448 P:26	Min	81.0
7	Gum content (Solvent washed), g/m ³	IS 1448 P:29	Max	40.0
8	Total Sulphur, mg/kg	ASTM D5453	Max	10.0
9	Reid Vapour Pressure (RVP) at 37.8°C, kPa	IS 1448 P: 39	Max	60.0
10	Vapour Lock Index (VLI = 10*RVP+7*E 70°C)	Calculation	Max	750 Summer 950 Other months
11	Benzene content percent by volume	ASTM D3606	Max	1.0
12	Copper strip corrosion for 3 hrs. at 50°C	IS 1448 P:15	-	Not worse than No.1
13	Oxidation stability, Minutes	IS 1448 P:28	Min	360.0
14	Olefin content, percent by volume	IS 1448 P:23	Max	21.0

15	Aromatics content, percent by volume	IS 1448 P:23	Max	35.0
16	Oxygen content, percent by mass	ASTM D6839	Max	3.7
17	Ethanol content, percent by volume	ASTM D4815	Max	5.0
18	Oxygenates percent by volume a) Ethers containing 5 or more 'C' atoms per molecules such as MTBE, ETBE or TAME b) Any other oxygenates	ASTM D4815	Max	15.0 Not permitted
19	Lead content (as Pb), g/l	IS 1448 P:112	Max	0.005
20	Water tolerance of motor gasoline-alcohol blends, temperature for phase separation, °C	IS 2796:2017 Annex- B	Max	0 Winter 10 for Other months
21	Engine intake system cleanliness, mg/kg	-	-	Report MFA used

**SPECIFICATION FOR AVIATION TURBINE FUEL
(KEROSENE TYPE - JET A-1)
IS 1571:2018**

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Appearance:			
a)	Visual appearance	Visual	-	Clear, bright and free from solid matter and un-dissolved water at ambient fuel temperature.
b)	Color	ASTM D6045	-	Report
c)	Particulate Contamination at point of manufacture.mg/l	ASTM D5452	Max	1.0
	Particulate channel count 1)Particulate, at point of manufacture, cumulative channel particle counts 2) $\geq 4 \mu\text{m(c)}$ 3) $\geq 6 \mu\text{m(c)}$ 4) $\geq 14 \mu\text{m(c)}$ 5) $\geq 21 \mu\text{m(c)}$ 6) $\geq 25 \mu\text{m(c)}$ 7) $\geq 30 \mu\text{m(c)}$	IP 577	-	ISO Code Report Report Report Report Report Report
2	Composition:			
a)	Total acidity, mg KOH/g	IS 1448 P:113	Max	0.015
b)	Aromatics, percent by volume	IS 1448 P:23	Max	25.0 (22.0 Defence Max)
	OR Total Aromatics percent by volume	ASTM D6379	Max	26.5
c)	Total Sulphur, percent by mass	ASTM D4294	Max	0.30 (0.25 Defence Max)
d)	Sulphur mercaptan, percent (m/m) OR	IS 1448 P:109	Max	0.0030 (0.0020 Defence Max)
e)	Doctor Test	IS 1448 P:19	-	Negative
f)	Refining components, at the point of manufacture			
	1) Non-hydro processed components , percent (v/v)		-	Report
	2) Mildly Hydro processed components, percent (v/v)		-	Report
	3) Severely hydro processed components, percent (v/v)		-	Report
	4) Synthetic components , percent (v/v)		-	Report as per IS 17081
3	Volatility:			
a)	Distillation:	IS 1448 P:18	-	Report
	1) Initial boiling point, °C			

	2) 10 percent recovery °C (v/v)		Max	205.0
	3) 50 percent recovery °C (v/v)		-	Report
	4) 90 percent recovery °C (v/v)		-	Report
	5) Final boiling point, °C		Max	300
	6) Residue, percent(v/v)		Max	1.5
	7) Loss ,percent (v/v)		Max	1.5
b)	Flash point (Abel), °C	IS 1448 P:20	Min	38.0
c)	Density at 15°C, kg/m ³	ASTM D4052	Min-Max	775.0-840.0
4	Fluidity:			
a)	Freezing point, °C	ASTM D7153	Max	Minus 47
b)	Kinematic viscosity at minus 20°C, mm ² /s	ASTM D7042	Max	8.000
5	Combustion:			
a)	Specific energy, MJ/kg	ASTM D 3338	Min	42.80
b)	Smoke point, mm or	IP 598	Min	25.0
	1) Smoke point, mm	IP 598	Min	18.0
	2)Naphthalenes, percent (v/v)	IS 1448 P:118	Max	3.00
6	Corrosion:			
a)	Copper strip corrosion for 2hrs at 100°C	IS 1448 P:15	-	Not worse than No.1
b)	Silver strip corrosion Classification for 4 h at 50°C	IS 1571:2018, Annex B	-	"0" at Refinery point
7	Thermal stability at control Temperature of 260°C.			
a)	JFTOT	ASTM D3241	Max	25.0
	1) Filter pressure differential, mm Hg			
	2) Tube Deposit rating, visual (VTR)			
b)	OR	ASTM D3241	Max	Less than 3, No Peacock (P) or Abnormal (A) color deposits
	2)Tube rating by ITR or ETR, Average over area of 2.5 mm ² in nm			
8	Contaminants:			
a)	Existent gum, mg/100ml	IS 1448 P:29	-	7.0
9	Water Separation Characteristic:			
a	Water reaction: Interface rating	IS 1448 P:42	Max	1b
b)	Micro-separometer rating at the point of manufacture:	IS 1448 P:142	Min	85.0
	1) MSEP without SDA			
	2) MSEP with SDA			
10	Conductivity			
	Electrical conductivity, pS/m	ISO 6297	Min	50
			Max	600

11	Lubricity:			
	Wear scar diameter, mm	ASTM D 5001	Max	0.85 (0.65 Defence Max)
13	Additives:			
a)	1)Static dissipater additive (SDA) Qualification ref no: RDE/A/621), mg/l		Max	3.00
b)	a) Antioxidant (for Hydro processed Qty), Qualification ref no: RDE/A/607,mg/l		Max	24

**SPECIFICATION FOR KEROSENE
GRADE A-Low Sulphur Kerosene
IS 1459:2018**

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Acidity, inorganic, mg KOH/g	ASTM D974	-	Nil
2	Appearance	Visual	-	Clear and Bright, free from un-dissolved water, foreign matter and other visible impurities
3	Burning quality a) Char value, mg /kg of oil consumed.	IS 1448 P:5	Max	20.0
	b) Bloom on glass chimney		-	Not darker than grey
4	Color a) Saybolt (in case of undyed kerosene)	ASTM D156	Min	10
5	Copper strip corrosion for 3 hrs. at 50°C	IS 1448 P:15	-	Not worse than No.1
6	Density at 15°, g/ml	ASTM D4052	-	Not limited, but to be reported
7	Distillation, a) Percent recovered below 200°C, percent (v/v) b) Final boiling point ,°C	IS 1448 P:18	Min	20.0
			Max	300
8	Flash point (Abel), °C	IS 1448 P:20	Min	35.0
9	Smoke point, mm	IP 598	Min	18.0
10	Total sulphur content, percent, m/m	ASTM D4294	Max	0.1000

**SPECIFICATION FOR AUTOMOTIVE DIESEL FUEL
(BHARAT STAGE VI)
IS 1460:2017**

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Appearance	Visual	-	Clear, bright and free from sediments, suspended matter and undissolved water at normal ambient fuel temperature
2	Acidity, Inorganic, mg KOH/g	ASTM D974	-	Nil
3	Acidity (Total), mg KOH/g	ASTM D974	Max	0.20
4	Ash, percent by mass	IS 1448 P:4	Max	0.01
5	Carbon residue (Micro) on 10% residue, percent by mass	ISO 10370	Max	0.30
6	Cetane number	IS 1448 P:9	Min	51
7	Cetane index	ASTM D4737	Min	46
8	Pour point, °C	ASTM D5950	Max	3 °C Winter 15 °C Summer
9	Copper strip corrosion for 3 hrs. at 50°C	IS 1448 P:15	-	Not worse than No.1
10	Distillation, 95 percent v/v recovery, °C	IS 1448 P:18	Max	360
11	Flash Point, °C	IS 1448 P:20/P:21	Min	35
12	Kinematic viscosity, cSt, at 40°C	IS 1448 P:25, Section 1	Min-Max	2.0 to 4.5
13	Total contamination, mg/kg	IP 440	Max	24
14	Density at 15°, kg/m ³	ASTM D4052	Min-Max	810.0-845.0
15	Total sulphur, mg/kg	ASTM D7220	Max	10
16	Water content, mg/kg	ISO 12937	Max	200
17	Cold Filter Plugging Point (CFPP), °C	ASTM D6371	Max	6°C Winter 18°C Summer
18	Oxidation stability, g/m ³	IS 1448 P:154	Max	25
19	Lubricity corrected wear scar diameter (wsd 1.4) at 60°C, microns	IS 1448 P:149	Max	460
20	Polycyclic Aromatic Hydrocarbon (PAH), percent by wt	IP 391	Max	8.0
21	FAME content, percent v/v	ASTM D7371	Max	7.0

**SPECIFICATION FOR HIGH FLASH HIGH SPEED DIESEL
IS 16861-2018**

S.NO	CHARACTERISTICS	TEST METHOD	LIMIT	REQUIREMENT
1	Appearance	Visual	-	Clear, bright and free from sediments, suspended matter and undissolved water at normal ambient fuel temperature
2	Acid Number, mg of KOH/g	ASTM D974	Max	0.5
3	Ash, percent by mass	IS 1448 P:4	Max	0.01
4	Carbon residue on 10 percent volume distillation residue, %	ISO 10370	Max	0.3
5	Cetane index	ASTM D4737	Min	45
6	Pour point	IS 1448 P:10	Max	3 °C Winter 15 °C Summer
7	Copper strip Corrosion for 3 h at 100°C	IS 1448 P:15	-	Not worse than No.1
8	Distillation, percent (v/v), recovered a) at 350°C b) at 370°C	IS 1448 P:18	Min Min	85 95
9	Flash point Pensky Martens Closed cup °C	IS 1448 P:21	Min	66
10	Kinematic viscosity, cSt ,at 40°C	IS 1448 P:25 SECTION 1	Min-Max	2.0 to 5.0
11	Density at 15°, kg/m3	ASTM D4052	Max	860
12	Total sulphur, % by mass	ASTM D4294	Max	0.20
13	Water content, ppm	ISO 12937	Max	500
14	Cold Filter Plugging Point (CFPP), °C	ASTM D6371	-	To report
15	Oxidation stability, g/m3	IS 1448 P:154	Max	25
16	Lubricity corrected WSD at 60°C, microns	ISO 12156-1	Max	520

**SPECIFICATION FOR FURNACE OIL MV2 Grade
IS 1593-2018**

S. NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Acidity, Inorganic	ASTM D974	-	Nil
2	Ash, percent by mass	IS 1448, P:4	Max	0.1
3	Carbon residue, mass percent	ISO 10370	Max	18.0
4	Gross Calorific Value	IS 1448 P:7	-	Report
5	Density at 15°C, kg/m ³	IS 1448 P:16	-	Report
6	Flash Point (Pensky Martens Closed), °C	IS 1448 P:21	Min	66.0
7	Kinematic Viscosity in centistokes at 50 °C	IS 1448 P:25	Min-Max	125- 180
8	Sediment, percent by mass	IS 1448 P:30	Max	0.25
9	Sulphur total, percent by mass	ISO 8754	Max	4.0
10	Water content, percent by mass	IS 1448 P:40	Max	1.0

SPECIFICATION FOR PAVING BITUMEN (VG 30) IS 73 - 2013

S. NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Penetration at 25 °C, 100g,5 sec,0.1mm	IS 1203	Min	45
2	Absolute Viscosity at 60°C, Poises	IS 1206(Part 2)	Min-Max	2400-3600
3	Kinematic viscosity at 135°C, cSt	IS 1206(Part 3)	Min	350
4	Flash Point (Cleveland Open Cup), °C	IS 1448 P:69	Min	220
5	Solubility in Trichloroethylene, Percent	IS 1216	Min	99.0
6	Softening Point (R&B),°C	IS 1205	Min	47
7	Test on Residue from Rolling Thin Film Oven Test		-	
	i)Viscosity ratio at 60°C,Calculation	IS 1206(Part 2)	Max	4.0
	ii) Ductility at 25°C, cm, after Rolling thin film oven test, cm	IS 1208	Min	40

SPECIFICATION FOR PAVING BITUMEN (VG 40)
IS 73 – 2013

S. NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT
1	Penetration at 25 ° C,100g,5 sec, 0.1mm	IS 1203	Min	35
2	Absolute Viscosity at 60°C, Poises	IS 1206(Part 2)	Min-Max	3200-4800
3	Kinematic viscosity at 135°C, cSt	IS 1206(Part 3)	Min	400
4	Flash Point (Cleveland open cup), °C	IS 1448 P:69	Min	220
5	Solubility in Trichloroethylene, Percent	IS 1216	Min	99.0
6	Softening Point (R&B), °C	IS 1205	Min	50
7	Test on Residue from Rolling Thin Film Oven Test			
	i)Viscosity ratio at 60°C, Calculation	IS 1206(Part 2)	Max	4.0
	ii)Ductility at 25°C, cm	IS 1208	Min	25