



एमआरपीएल

गुणवत्ता नियंत्रण प्रयोगशाला

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MRPL

QC LABORATORY

IS PRODUCTS SPECIFICATION:2018

INDIAN STANDARD (IS) SPECIFICATION FOR DOMESTIC PRODUCTS: 2018

S. No	Product Name	Specification Number
1	Liquefied Petroleum Gases (LPG)	IS 4576: 1999-Second Revision, Reaffirmed 2014, Amendment 1,2003
2	Motor Gasoline – MG 91 BS IV	IS 2796:2017- 6 th Revision
3	Aviation Turbine Fuels, (ATF) Kerosene Type, JET A-1	IS 1571:2017, 9 th revision, and Defence Standard 91-91, Issue 7,Amendment 3 dated 02.02.2015.
4	Kerosene	IS 1459: 2016, 3 rd Revision, Amendment 1
5	Automotive Diesel Fuel – Bharat Stage BS IV	IS 1460: 2017,6 th Revision
6	High Flash High Speed Diesel (HFHSD)	IS 16861:2018, New Standard
7	Fuel Oil- MV2 Grade	IS 1593: 1982, Reaffirmed 2014, Second Revision, Amendment 1 & 2
8	Paving Bitumen -VG 30	IS 73: 2013, 4 th Revision
9	Paving Bitumen -VG 10	IS 73: 2013, 4 th Revision
10	Paving Bitumen -VG 40	IS 73: 2013, 4 th Revision
11		
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**SPECIFICATION FOR LIQUEFIED PETROLEUM GAS
(Commercial Butane-Propane Mixture)
IS 4576 – 1999**

S. No	CHARACTERISTIC	UNIT	REQUIREMENT	TEST METHOD
1	Density@ 15°C	g/ml	Report	ASTM D 2598
2	Vapour pressure at 40°C	kPa	1050 Max.	ASTM D 1267
3	Composition, Liquid		-	ASTM D 2163
	i. C2 Hydrocarbons (Ethane)	Vol%	Report	-
	ii. C3 Hydrocarbons (Propane)	Vol%	Report	-
	iii. C4 Hydrocarbons (Iso- Butane)	Vol%	Report	-
	iv. C4 Hydrocarbons (n- Butane)	Vol%	Report	-
	v. C5 Hydrocarbons & Heavier	Vol%	Max 2.5	-
	vi. Unsaturated Hydrocarbons	Vol%	Report	-
	OR		-	-
4	Volatility evaporation temperature in °C for 95 % by vol. at 760 mm Hg pressure	°C	Max +2	ASTM D 1837
5	Total Volatile Sulphur	ppm	Max 150.0	ASTM D 3246
6	Copper Corrosion @ 38°C, for 1 hour.		Not worse than No. 1	ASTM D 1838
7	Hydrogen Sulfide		Pass	ASTM D 2420
8	Free water Content		None	VISUAL

**SPECIFICATION FOR MOTOR GASOLINE
(REGULAR)MG 91
BHARAT STAGE IV
IS 2796 – 2017**

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT	TEST RESULTS
1	Appearance	Visual	-	Clear and bright, Free from un-dissolved water, foreign matter and other impurities.	Clear and bright, Free from un-dissolved water, foreign matter and other impurities.
2	Colour	Visual	-	Orange	
3	Density at 15°,kg/m ³	ASTM D 4052	-	720 to 775	
4	Distillation a) percent evaporated at 70°C (E 70°C), percent v/v b) percent evaporated at 100°C (E 100°C), percent v/v c) percent evaporated at 150°C (E 150°C), percent v/v d) Final boiling point,°C e) Residue, percent by volume	ASTM D 86	- - Min Max Max	10-45 40-70 75 210 2.0	
5	Research octane number (RON)	IS 1448 P:27	Min	91	
6	Motor octane number (MON)	IS 1448 P:26	Min	81	
7	Gum content (Solvent washed),g/m ³	IS 1448 P:29	Max	40	
8	Total sulphur, mg/kg	ASTM D 5453/P:153	Max	50	
9	Lead content (as Pb), g/l	IP 224 #	Max	0.005	
10	Reid vapour pressure (RVP) at 38°C, kPa	IS 1448 P: 39	Max	60	
11	Vapour lock index (VLI) VLI= 10 RVP+7E 70°C	Calculation	Max	750 Summer 950 Other months	
12	Benzene content percent by volume	ASTM D 3606	Max	1.0	
13	Copper strip corrosion for 3 h at 50°C	IS 1448 P:15	-	Not worse than No.1	
14	Water tolerance of motor gasoline-alcohol blends, temperature for phase separation	IS 2796:2017 Annex-B #	Max	0°C Winter 10°C Other months	

15	Engine intake system cleanliness	-	-	Report MFA used	
16	Olefin content, percent by volume	ASTM D 1319/IS 1448 P:23	Max	21	
17	Oxidation stability, minutes	IS 1448 P:28	Min	360	
18	Aromatics content, percent by volume	ASTM D 1319/IS 1448 P:23	Max	35	
19	Oxygen content, percent by mass	ASTM D 6839 #	Max	3.7	
20	Ethanol content, percent by volume	ASTM D 4815 #	Max	5.0	NA
21	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 D 4815-Annex C #	Max -	15 Not permitted	

Remarks:

Notes:

1. The Quality Certificate shall not be reproduced except in full, without written approval of the Laboratory.
2. Reported results are pertaining to the sample received at laboratory.
3. MRPL Motor Gasoline does not contain any oxygenates.
4. NA : Not Applicable
5. Summer shall be the period from April to July months.
6. # Not under the scope of NABL Accreditation.

SPECIFICATION FOR AVIATION TURBINE FUEL JET A-1 IS 1571-2017

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT	TEST RESULTS
1	<i>Appearance:</i>				
a)	Visual appearance	Visual	-	Clear, bright and free from solid matter and un-dissolved water at ambient fuel temperature.	Clear, bright and free from solid matter and un-dissolved water at ambient fuel temperature.
b)	Colour	ASTM D 6045	-	Report	
c)	Particulate contamination at point of manufacture.mg/l	ASTMD 5452	Max	1.0	
d)	Particulate, at point of manufacture, cumulative channel particle counts, 1) $\geq 4 \mu\text{m(c)}$ 2) $\geq 6 \mu\text{m(c)}$ 3) $\geq 14 \mu\text{m(c)}$ 4) $\geq 21 \mu\text{m(c)}$ 5) $\geq 25 \mu\text{m(c)}$ 6) $\geq 30 \mu\text{m(c)}$	IP 565	-	ISO code Channel counts Report Report Report Report Report Report	
2	<i>Composition:</i>				
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)	
c)	Total sulphur, percent by mass	ASTM D 4294	Max	0.30 (0.25 Defence Max)	
d)	Sulphur mercaptan , percent (m/m)	IS 1448 P:109	Max	0.003 (0.002 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) Severely Hydro processed components, percent (v/v)	-	-	Report	
	3) Mildly hydro processed components, percent (v/v)	-	-	Report	
	4) Synthetic components, percent (v/v)	-	-	Report	
3	<i>Volatility:</i>				

a)	Distillation: 1) Initial boiling point, °C 2) 10 percent recovery °C (v/v) 3) 50 percent recovery °C (v/v) 4) 90 percent recovery °C (v/v) 5) Final boiling point, °C 6) Residue, percent (v/v) 7) Loss, percent (v/v)	ASTM D 86	Max	Report 205.0 Report Report	
b)	Flash point (Abel), °C	IP 170	Min	38.0	
c)	Density at 15°C, kg/m ³	ASTM D 4052	-	775.0 to 840.0	
4	Fluidity:				
a)	Freezing point, °C	ASTM D 5972	Max	Minus 47	
b)	Kinematic viscosity at minus 20°C, mm ² /s	IS 1448 P:25	Max	8.000	
5	Combustion:				
a)	Specific energy MJ/kg or Product of API gravity and aniline point.	ASTM D 3338 IS 1448 P:3	Min	42.80 4800	
b)	Smoke point, mm or 1) Smoke point, mm 2) Naphthalenes, percent (v/v)	IP 598 IS 1448 P:118	Min Min Max	25.0 19.0 3.00	-
6	Corrosion:				
a)	Copper strip corrosion for 2 h at 100°C	IS 1448 P:15	-	Not worse than No.1	
b)	Silver strip corrosion Classification for 4 h at 50°C	IP 227	-	"0" at Refinery point "1" at Delivery point	
7	Thermal stability at control Temperature of 260°C.				
a)	Filter pressure differential, mm Hg	IS 1448 P:97	Max	25 Less than 3, No 'Peacock' (P) or 'Abnormal' (A)	
b)	Tube rating, visual				
8	Contaminants:				
a)	Existent gum, mg/100ml or	IS 1448 P:29	Max	7	-
b)	Existent gum with air, mg/100 ml			7	
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			-

	1) MSEP without SDA 2) MSEP with SDA		Min Min	85 70	
10	Conductivity				
	Electrical conductivity, pS/m (at the point,time & temperature of delivery)	ISO 6297	Min Max	50 600	
11	Lubricity:				
	Wear scar diameter,mm	ASTM D 5001	Max	0.85(0.65 Defence Max)	
12	Additives:				
	a) Static dissipater additive (SDA, mg/l) Qualification ref no: RDE/A/621 b) Antioxidant (for Hydro processed Qty) ,mg/l Qualification ref no: RDE/A/607	-	Max -	3.0 17 to 24	

Remarks:

Notes:

1. Latest methods of IS 1448 used for testing unless specified otherwise.
2. The Quality Certificate shall not be reproduced except in full, without written approval of the Laboratory.
3. No additive is added other than the ones mentioned in S. No: 12.
4. Both number of particles and number of particles as a scale number as defined under Table of ISO 4406:1999 are reported.
5. FAME Content- Not measured-Risk assessed in accordance with JIG Bulletin 75.

SPECIFICATION FOR KEROSENE IS 1459 -2016

S.NO	CHARECTERISTIC	TEST METHODS	LIMIT	REQUIREMENT	TEST RESULT
1	Acidity,inorganic	ASTM D 974	-	Nil	
2	Burning quality a) Char value,mg/kg of oil consumed.	IS 1448 P:5	Max	20	
	b) Bloom on glass chimney		-	Not darker than grey	
3	Colour a) Saybolt (in case of undyed kerosene)	ASTMD 156	Min	10	
	b) Visual (in case of dyed kerosene)	Visual Annex A	-	Blue	NA
4	Copper strip corrosion for 3 h at 50°C	IS 1448 P:15	-	Not worse than No.1	
5	Density at 15°,kg/m ³	ASTM D 4052	-	Not limited ,but to be reported	
6	Distillation, a) Percent recovered upto 200°C,percent (v/v) b) Final boiling point ,°C	ASTM D 86	Min	20	
			Max	300	
7	Flash point (Abel),°C	IP 170	Min	35	
8	Smoke point, mm	IS 1448 P:31	Min	18	
9	Total sulphur content, percent, m/m	ASTM D 4294	Max	0.20	

Remarks:

Notes:

1. The Quality Certificate shall not be reproduced except in full, without written approval of the Laboratory.
2. Only latest version is used for all test methods.
3. Reported results are pertaining to the sample received at laboratory.
4. Test in serial no. 2, is done at refinery end only.
5. The material is free from visible water, sediment and suspended matter and not doped with blue dye.

**SPECIFICATION FOR AUTOMOTIVE DIESEL FUEL
(BHARAT STAGE IV)
IS 1460 – 2017**

S.NO	CHARACTERISTIC	TEST METHOD	LIMIT	REQUIREMENT	TEST RESULTS
1	Appearance	Visual	-	Clear, bright and free from sediments, suspended matter and undissolved water at normal ambient fuel temperature	Clear, bright and free from sediments, suspended matter and undissolved water at normal ambient fuel temperature
2	Acidity,inorganic,mg of KOH/g	ASTM D 974	-	Nil	
3	Acidity,total,mg of KOH/g	ASTMD 974	Max	0.20	
4	Ash,percent by mass	IS 1448 P:4	Max	0.01	
5	Carbon residue(Ramsbottom or micro) on 10 percent residue,percent by mass	ASTM D 4530	Max	0.30	
6	Cetane number	IS 1448 P: 9	Min	51	
7	Cetane index	IP 380	Min	46	
8	Pour point	ASTM D 5950	Max	3 °C Winter 15 °C Summer	
9	Copper strip corrosion for 3 h at 50°C	IS 1448 P:15	-	Not worse than No.1	
10	Distillation,95 percent v/v, recovery, °C	ASTM D 86	Max	360	
11	Flash point,				
	a) Abel, °C	IP 170	Min	35	
	b)PMCC,°C	ASTM D 93A	Min	66	
12	Kinematic viscosity, cSt, at 40°C	IS 1448 P:25	-	2.0 to 4.5	
13	Total contamination, mg/kg	IP 440	Max	24	
14	Density at 15°,kg/m3	ASTM D 4052	-	815 to 845	

15	Total sulphur, mg/kg	ASTM D 5453/D 4294	Max	50	
16	Water content, mg/kg	ISO 12937	Max	200	
17	Cold Filter Plugging Point (CFPP)	ASTM D 6371	-	6°C Winter 18°C Summer	
18	Oxidation stability,g/m3	IS 1448 P:154	Max	25	
19	Polycyclic Aromatic Hydrocarbon (PAH),percent by mass	IP 391	Max	8	
20	Lubricity corrected wear scar diameter (wsd 1.4) at 60°C,microns	ISO 12156/P: 149	Max	460	
21	FAME content,% v/v	ASTM D 7371#	Max	7.0	- *

Remarks:

Notes:

1. The Quality Certificate shall not be reproduced except in full, without written approval of the Laboratory.
2. Reported results are pertaining to the sample received at laboratory.
3. MRPL Diesel fuel does not contain any residuum oil and ignition improver additives.
4. Whenever Abel Flash point exceeds 66°C, PMCC flash point value will be reported.
5. Winter months are from November to February, rest of the months of the year shall be called as summer.
6. # Not under the scope of NABL Accreditation.
7. * MRPL Automotive Diesel Fuel does not contain any FAME/Biodiesel, so FAME analysis is not applicable.

SPECIFICATION FOR HFHSD IS 16861–2018

S.NO	CHARACTERISTICS	TEST METHODS	LIMIT	REQUIREMENT	TEST RESULT
1	Appearance	Visual	-	Clear and Bright	Clear and Bright
2	Acid Number, mg of KOH/g	ASTM D 974	Max	0.5	
3	Ash, percent by mass	IS 1448 P:4	Max	0.01	
4	Carbon residue on 10 percent volume distillation residue,% mass	ASTM D 4530	Max	0.3	
5	Cetane index	ASTM D 4737	Min	45	
6	Pour point	ASTM D 97	Max	3 °C Winter 15 °C Summer	
7	Copper strip Corrosion for 3 h at 100°C	ASTM D 130	-	Not worse than No.1	
8	Distillation,% (v/v), recovered a) at 350°C b) at 370°C	ASTM D 86	Min	85 95	
9	Flash point Pensky Martens closed cup °C	ASTM D 93	Min	66	
10	Kinematic viscosity, cSt ,at 40°C	IS 1448 P:25	-	2.0 to 5.0	
11	Density at 15°,kg/m ³	ASTM D 4052	Max	860	
12	Total sulphur, % by mass	ASTM D 4294	Max	0.20	
13	Water content, ppm	ISO 12937	Max	500	
14	Cold Filter Plugging Point (CFPP),°C	ASTM D 6371	-	To report	

15	Oxidation stability, g/m ³	ASTM D 2274	Max	25	
16	Lubricity corrected WSD at 60°C, microns	ISO 12156- 1	Max	520	

Remarks:

Notes:

1. The Quality Certificate shall not be reproduced except in full, without written approval of the Laboratory.
2. Reported results are pertaining to the sample received at laboratory.
3. MRPL Diesel fuel does not contain any residuum oil.
4. Requirement of S.No 16 , is applicable to fuels with a sulphur content below 500 ppm.
5. Winter months are from November to March, rest of the months of the year shall be called as summer.
6. # Not under the scope of NABL Accreditation.

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**SPECIFICATION FOR FURNACE OIL
MV2 Grade
IS 1593 – 1982**

S. No	CHARACTERISTIC	UNIT	REQUIREMENT	TEST METHOD
1	Acidity, Inorganic	mg KOH/gm	Nil	IS 1448, P: 2
2	Ash	% Mass	Max 0.1	IS 1448, P: 4
3	Gross Calorific Value	Cal/gm	Report	IS 1448, P: 7
4	Relative Density @ 15/15°C	-	Report	IS 1448, P: 32
5	Flash Point (PMC)	°C	Min 66.0	IS 1448, P: 21
6	Kinematic Viscosity at 50 ° C	cSt	Max 180	IS 1448, P: 25
7	Sediment	% Mass	Max 0.25	IS 1448, P: 30
8	Total Sulphur	% Mass	Max 4.0	ASTM D 4294 IS 1448,P:33
9	Water content	% Vol	Max 1 0	IS 1448, P: 40
10	Pour Point	°C	Report	ASTM D 97
11	Cleanliness	Number	Report	ASTM D 4740
12	Micro Carbon Residue	% Mass	Report	ASTM D 4530
13	Asphaltenes	% Mass	Report	IP 143
14	Net calorific value	Cal/gm	Report	IS 1448 P:6

Note: Tests indicated in Sl. No. 11-14 is as per customer requirements.

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

S. No	CHARACTERISTIC	UNIT	REQUIREMENT	TEST METHOD
1	Specific Gravity/Density at 27°C/27°C	-	Report	IS 1202
2	Absolute Viscosity at 60°C	poises	Range 2400-3600	IS 1206(Part 2)
3	Kinematic viscosity at 135°C	cSt	Min 350	IS 1206(Part 3)
4	Flash Point (COC)	°C	Min 220	IS 1448 P:69
5	Solubility in Trichloroethylene	%	Min 99.0	IS : 1216
6	Penetration at 25 ° C,100 g,5 sec	0.1 mm	Min 45	I S: 1203
7	Softening Point (R&B)	°C	Min 47	I S: 1205
8	Tests on Residue from thin film oven tests/ RTFOT			
i)	Viscosity ratio at 60°C	Calculation	Max 4.0	IS 1206(Part 2)
ii)	Ductility at 25°C, cm, after Rotating thin film oven test	cm	Min 40	IS 1208

**SPECIFICATION FOR PAVING BITUMEN (VG 10)
IS 73 - 2013**

S. No	CHARACTERISTIC	UNIT	REQUIREMENT	TEST METHOD
1	Specific Gravity/Density at 27°C/27°C	-	Report	IS 1202
2	Absolute Viscosity at 60°C	poises	Range 800-1200	IS 1206(Part 2)
3	Kinematic viscosity at 135°C	cSt	Min 250	IS 1206(Part 3)
4	Flash Point (COC)	°C	Min 220	IS 1448, P:69
5	Solubility in Trichloroethylene	%	Min 99.0	IS : 1216
6	Penetration at 25 °C,100 g,5 sec	0.1 mm	Min 80	I S: 1203
7	Softening Point (R&B)	°C	Min 40	I S: 1205
8	Tests on Residue from thin film oven tests/ RTFOT			
i)	Viscosity ratio at 60°C	Calculation	Max 4.0	IS 1206(Part 2)
ii)	Ductility at 25°C, cm, after Rotating thin film oven test	cm	Min 75	IS 1208

**SPECIFICATION FOR PAVING BITUMEN (VG 40)
IS 73 - 2013**

S. No	CHARACTERISTIC	UNIT	REQUIREMENT	TEST METHOD
1	Specific Gravity/Density at 27°C/27°C	-	Report	IS 1202
2	Absolute Viscosity at 60°C	poises	Range 3200-4800	IS 1206(Part 2)
3	Kinematic viscosity at 135°C	cSt	Min 400	IS 1206(Part 3)
4	Flash Point (COC)	°C	Min 220	IS 1448 P:69
5	Solubility in Trichloroethylene	%	Min 99.0	IS : 1216
6	Penetration at 25 ° C,100 g,5 sec	0.1 mm	Min 35	I S: 1203
7	Softening Point (R&B)	°C	Min 50	I S: 1205
8	Tests on Residue from thin film oven tests/ RTFOT			
i)	Viscosity ratio at 60°C	Calculation	Max 4.0	IS 1206(Part 2)
ii)	Ductility at 25°C, cm, after Rotating thin film oven test	cm	Min 25	IS 1208