

## CRITERIA/ MINIMUM REQUIREMENT FOR OIL TESTING FACILITY

### EQUIPMENT REQUIREMENT

(i) FOR ENERGY PRODUCTS' TESTING

Sr. No.	Equipment	Purpose	Relevant Method	ASTM/IP
1	Hydrometer (Fuel range)	Specific Gravity/ Relative Density	D-1298/ D-4052/ IP-160	
2	CFR Engine or Octane Analyzer	Octane Number	D-2699 or as per Instrument Manual	
3	Distillation apparatus (manual or automatic)	Distillation	D-86/ D-7344/ D-7345	
4	Assembled lamp unit/ apparatus or X-ray Fluorescence Analyzer (Energy-dispersive or Wavelength dispersive)	Sulfur (in gasoline)	D-1266/ D-4294/ IP-107	
5	Infrared Spectrometer or Gas Chromatograph	Benzene & oxygenates	D-5134/ D-4053/ D-4815/ D-5845	
6	Atomic Absorption Spectrometer or Inductive Coupled Plasma atomic absorption spectrometer	Metals	D-3237/ D-5059/ IP-224/ IP-352	
7	Cloud Point tester	Cloud Point	D-2500	
8	Pour Point Tester <b>or</b> Cold Filter Plugging Point (CFPP) Apparatus	Pour Point  or CFPP	D-97  Or IP-309	
9	Pensky-Martens Closed Cup Tester	Flash Point	D-93	
10	X-Ray Fluorescence Analyzer (Energy-dispersive or Wavelength dispersive) or Combustion & Iodate Detection System	Sulfur (in Diesel)	D-1552/ D-2622/ D-4294	
11	Viscometer and Viscometer Bath	Kinematic Viscosity	D-445	
12	Dean Stark Apparatus	Water	D-95	
13	Titration apparatus (burette etc.)	Acid number (total/ strong)	D-974	
14	Fume Hood, General Glassware, balance, stirrer, Oven, burner, hot plate, thermometer etc.	For general/ various purpose	(General Purpose)	

(ii) FOR NON-ENERGY PRODUCTS' TESTING

<b>Sr. No.</b>	<b>Equipment</b>	<b>Purpose</b>	<b>Relevant ASTM or other standard Method</b>
1	Cleveland Open Cup Apparatus (manual or automatic)	Flash point (Lubes)	D-92
2	Viscometer and Viscometer Bath (two units for 40°C and 100°C)	Kinematic viscosity/ Viscosity Index (Lubes)	D-445/ D-2270
3	Pour Point Apparatus	Pour point	D-97
4	Atomic Absorption Spectrometer or Inductive Coupled Plasma atomic absorption spectrometer or X-Ray Fluorescence Analyzer	Metals	D-6481/D-7751 or other relevant standard methods for AAS/ ICP
5	Potentiometric Titrimeter	Total Base Number (TBN)	D-2896
6	Muffle Furnace	Ash/ Sulphated Ash	D-482/ D-874
7	Hydrometer (lube range)	Specific Gravity/ Relative Density	D-1298/ ISO 3675/ISO 12185
8	Titration apparatus (burette etc.)	Total Acid Number	D-974
9	General Glassware, balance, stirrer, Oven, burner, hot plate, thermometer etc.	For general/ various purpose	-----

**HUMAN RESOURCE REQUIREMENT**

01 analyst (M.Sc Chemistry level) per location

03 Analysts (B.Sc Level with chemistry) per location

**Personal Protective Equipment (PPE)**: Goggles, Gloves, Lab Wears etc.

**Certification**: Minimum level of ISO 9001 (ISO 17025 preferable)