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		Ethiopian Conformity Assessment Enterprise		TLD/F6.05-5	
				Copy No:	Rev No:
				0	
Specification				Page No:	Effective date:
				1 of 1	1-Sep-19
Laboratory:	Biochemical Testing Laboratory Directorate, Microbiological Laboratory				
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Prepared By	Zerihun Abebe,				Signature
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Contract Ref					Year
					2023

Lot -1: Description: - Those categories of instruments are listed under similar LOT due to specific scope of products testing instruments, which is **dedicated for quality control and quality assurance of petroleum and petroleum products** at laboratory level.

Petroleum Testing Equipments		ECAE Specification					Bidder Name:		Evaluating Note on Scoring (C = Comply, NC = Not Comply)	
Category of specification		Items and Specification		Specification/Requirement	Lead Time ( days)	Warranty	Part Number/ Evidence (for applicable & critical component)	Bidder Remark	Evaluation	Remark
Item. 01.01		Automatic Freezing Point Analyzer with built-in cooling system								
1. Description/Scope		Measure up to -100°C (-148°F) without the need of an external cooling bath. The unique patented detection cell provides ultra-high accuracy with unmatched precision, while maintaining its compact footprint used for the determination of the temperature below which solid hydrocarbon crystals may form in aviation turbine fuels. Compliant with ASTM D7153, IP529, DEF STAN 91-91 and Correlation to ASTM D2386, IP 16, ISO 3013, JIS K2276								
		Compact design with built-in cooling system and self-contained cleaning With new touch-screen and advanced electronics								
2. Unique Identification feature		2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided								
		2.2. Country of origin shall be declared								
3. Status of the Instrument		It shall be new (Refurbished equipment will not be accepted)/ shall be declared								
4. Quantity		2 Sets								
5. Test Method and Verification Standards		Compliant with ASTM D7153, IP529, DEF STAN 91-91 Correlation to ASTM D2386, IP 16, ISO 3013, JIS K2276								
6. Technical Specification										
Temperature Range		Down to -100°C (-148°F)								
Cooling System		Internal								
Internal Memory		200 test runs								
HMI/MMI		7.4" color touch-screen								
Detection		Optical, patented								
Out put		Output 2x USB, 1x Serial, 1x Ethernet								
Operator Time		0.5 minute per test								
Test Duration		15 minutes								
Sample Volume		10 ml, including volume for cleaning								
Sample Injection		Disposable 10- or 20-ml syringe								
Cleaning		Self-cleaning operation, no cleaning required								
Calibration		Automatic calibration routine for temperature measurement. 10°C interval probe correction capabilities. Programmable calibration frequency. Calibration ticket printing.								
PC Networking		IRIS software								
Data Management		Test progress & graphic, self-diagnosis tools, quality features								
Printing		Network printer (one printer for multiple analyzers)								
Data Storage		50 complete test reports stored locally, unlimited with P								

Software features	handle: - Run controls, calibration, Quality control, instrument parameters, result and report							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, 200W							
6.2. Dimensions	(W x D x H) in cm= 25x60x25 +/- 20%							
6.3. Weight	30kg, maximum							
6.4 Spare parts/Accessories	Freezing point Certified reference solutions for quality control purpose, certificate value: -50°C, applicable for ASTM D2386, ISO 3013, Quantity: 4x225 ml							
	Detector Spare, Quantity= 1							
	Glass Container spare with tubing quantity=1							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive or compliance equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.02	Automatic closed-cup flash point tester							
1. Description/Scope	Automatic high-precision flash point testing in the petroleum, chemical, and fragrance industries, and for test laboratories, measuring range 20 °C to 410 °C, integrated fire-extinguishing system Saves you time due to fast turn-around time between samples with Maximum safety, low operating costs, high degree of automation							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							

5. Test Method & Verification Standards	for determining the flash point according to ASTM D93 Methods A, B + C, EN ISO 2719, JIS K 2265-A, B; and IP 34							
6. Technical Specification								
Heating system	Heater block according to standard Test method or user-defined heat rate: 0.5 °C to 12 °C/min.							
Temperature measurement	Rugged metal and intelligent Pt100 probe with built-in calibration, 12 calibration points							
Sample stirrer	Automatic stirrer: test method or user-defined from 0 rpm to 500 rpm							
Ignition source	Electric igniter, encapsulated hot wire type with automatic power management or automatic gas ignition with gas flame monitoring, test method or user-defined test interval							
Barometric pressure sensor	Built-in sensor for automatic correction of flash point, with inbuilt calibration memory, pressure units: Pa, hPa, kPa, bar, mbar, psi, mmHg (Torr)							
Flash point detection system	Thermal flash point detection							
User interface	7" color touchscreen, alphanumeric data input, bar code reader							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz,							
6.2. Dimensions	(W x D x H) Approx.480 mm x 400 mm and a height of 250 mm +/- 20%							
6.3. Weight	10 to 20kg, maximum							
6.4 Spare parts/Accessories	Application set ASTM D93, ISO 2719, Quantity 1 set							
	Mini cup test inserts compatible with the equipment and complete							
	Calibration set, Quantity 1 (includes: - 1 calibration lid, - 1 digital thermometer GMH with temperature sensor with certificate and 1 Pt100 collar and set screw							
	Test insert complete							
	Lid complete							
	Cup with handle							
	Tray set Quantity 2							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
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	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
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	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							

Item. 01.03	Automated Vapor Pressure Apparatus							
1. Description/Scope	Covers procedure for the determination of vapor pressure of gasoline, volatile crude oil, and other volatile petroleum products. The Reid method is particularly suitable for determination of vapor pressure of crude oil for transportation, storage and general handling purpose. The instrument directly measures the Reid vapor pressure without correlation or calculation.							
	Suited for testing viscous and difficult products. User-friendly interface							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	Comply ASTM D 323, D4953, ISO 3007, IP 69							
Reported results	Reported Results: REID or TVP							
	Bath: 37.8°C (100°F) or 50.0°C							
	Pressure range: Up to 250 kPa							
	Resolution: 0,1 kPa							
	Test time: Less than 15 minutes typical							
	Interface:8" full-color touch screen							
	Language: English							
	Results storage: Database, USB stick, LAN							
	Communication: 2 x USB 2.0, Ethernet port							
	Printing: Graphic printer							
	Bath: Stainless steel bath with capacity of 31 Liters							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, consumption 2kW							
6.2. Dimensions	(W x D x H) 720 x 440 x 460 mm +/- 20%							
6.3. Weight	70kg, maximum							
6.4 Spare parts/Accessories								
6.4.1 Printer	Printer 112mm 230V 50/60Hz Industrial thermal printer. Delivered pre-configured, with cable, adapter and 10 paper rolls							
6.4.2 Calibration Pressure Kit 220V 50/60Hz	Including: a digital manometer, manual pressure pump, a manual vacuum pump, a connection pipe with quick connector, a connection pipe to be connected on the rear panel, a carrying case and a traceable calibration certificate							
6.4.3 Filling Device	Filling device (ASTM D323 A.1.8)							
6.4.4 caps	Set of 2 caps (for ASTM D4953 method)							
6.4.5 Brass complete REID test vessel	Stainless steel complete REID test vessel							
6.4.6 Brass Vapor chamber with fast coupling	Stainless steel Vapor chamber with fast coupling (Supplied with sealing O-rings)							
6.4.7 Brass Liquid chamber 1 opening with fast coupling	Stainless steel Liquid chamber 1 opening with fast coupling							
6.4.8 Brass Pressure link with flexible tube and quick connector	Stainless steel pressure link with flexible tube and quick connector							
6.4.9 O rings	O-Ring Seals (pack of 10)							
6.4.10 printer paper	Set of 10 printer paper rolls 112mm							
6.4.11 Connector	Quick connector for pressure link (Quantity 2)							
6.4.12 Flexible hose	Flexible pressure hose D6 mm 1 meter (Quantity 3)							
6.4.13 Thermometer	Thermometer ASTM 18C (Quantity 2)							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English.							

	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
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	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
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	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.04	Automatic Distillation tester							
1. Description/Scope	For testing different types of samples such as gasoline, kerosene, diesel, organic solvents, and benzene products							
	Unknown sample test with Automatic residual and loss calculation							
	Easy operation and the Software can remotely troubleshoot							
	One-button Start. Automatically completes sample distillation testing, saves, prints, or uploads the measurement result data.							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	ASTM D86, ASTM D850, EN ISO 3405, IP 123 and 195, DIN 51 751, NF M07-002, GB/T 6536, GB/T 3146.1, ASTM D1078							
6. Technical Specification	With built in Ticket printer, automatic heater base plate detection and reduction of VOC emission and with crude oil testing capability.							
Steam temperature Range: 0 - 450°C	0 - 450°C							
	accuracy Pt 100 IEC 751 probe Class A							
vapor temperature	Built in calibration memory with 10-point calibration table and automatic probe ID							
	detection; calibration history; optional calibration certificate							
sample volume	Optical measuring system compatible with samples producing smoke in the receiver with self-positioning heater lift; range 0 to 103% charge volume; resolution: 0.03ml, accuracy: ± 0.1ml							
ambient pressure	Built-in pressure sensor, range to 70 to 110 kPa A (500 to 800 mmHg)							
User Errors Prevention	Detector for heater base plate type, Detector for vapor probe and centering device Detectors for "receiver in place" and "receiver chamber door open" Detector for "condenser cleaned							

Software features	Run Control							
	• Results, Calibration, Instrument Parameters							
	• Reports, Quality Control, Method Definition							
	• Specs Definition, Test Start, Results Evaluation							
Connectivity	3 USB for external printer, barcode reader and memory stick; RS232C serial port							
	for LIMS connection; Ethernet RJ45 port for LIMS connection and unit networking;							
	Connection to external PC and printer with Software and license							
Operating Requirements	Temperature 10 to 35°C (50 to 95°F); relative humidity up to 80% at 35°C (95°F)							
	Multi Voltage 100 to 240V; 1400 W							
Results storage	1000 result data or expand storage capacity as needed.							
Safety	Built in fire extinguisher with 2 fire sensors							
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, Total Power < 1200W							
6.2. Dimensions	4cm W * 57cm D * 65cm H +/-20%							
6.3. Weight	70kg, maximum							
6.4 Spare parts/Accessories								
	• Measuring Cylinder 100ml with brass base, QTY 2							
	• Flask 125ml , QTY 2							
	• Vapor Probe Stopper for 100ml, 125ml and 250ml flask QTY 2 for each							
	• Vapor Probe wire guide, QTY 2							
	• Vapor Probe holder, QTY 2							
	• Heater Base Plate 50 mm opening, QTY 2							
	• Heater Base Plate 38 mm opening, QTY 2							
	• Silicone hose for flask connection, QTY, 10 m							
	• Rubber Cap for Measuring Cylinder, QTY 2							
	• Condenser Cleaner, QTY 2							
	• Receiver Chamber Liquid Vessel, QTY 2							
	• Hose connection piece, QTY 2							
	• Set of hexagonal wrenches, QTY 1							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English.With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
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	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							

	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
9. Delivery Schedule	9.1 Not more than three to four months from the time of the order placement							
Item. 01.05	Copper Strip Corrosion - Test Tube Bath							
1. Description/Scope	The Copper Strip Tarnish Test assesses the relative degree of corrosivity of petroleum products, including aviation fuels, automotive gasoline, natural gasoline, solvents, kerosene, diesel fuel, distillate fuel oil, lubricating oil and other products. A polished copper strip is immersed in 30mL of sample at elevated temperature. After the test period, the strip is examined for evidence of corrosion and a classification number from 1-4 is assigned based on a comparison with the ASTM Copper Strip Corrosion Standards. For aviation fuels and natural gasoline, the sample tube is placed inside a stainless-steel pressure vessel during testing.							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5. Test Method & Verification Standards	conforms to the specifications of: ASTM D130, D6074, D6158; FSPT DT-28-65; IP 154; ISO 2160; DIN 51759; FTM 791-5325; NF M 07-015							
6. Technical Specification								
Capacity:	17 test tubes							
Maximum Temperature:	190°C (374°F)							
Temperature Control Stability:	±1°C (±2°F)							
Heater Range:	0-750W							
Bath Medium:	5-gal (18.9L) water or high temperature heater transfer fluid							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, Single Phase, 4A							
6.2. Dimensions	(W x D x H) in cm: (39x32x36) +/-20%							
6.3. Weight	20kg, maximum							
6.4 Spare parts/Accessories	test Pressure Vessel Rack Quantity 2							
	Rack, 4-Pressure Vessel, 8- Tube, Quantity 2							
	Rack, 6-Pressure Vessel, 6-Tube, Quantity 2							
	Copper Test Strip - 12.5x1.5-3.0mm x 75mm to ASTM specifications, Quantity 2							
	Test Tube - 25 x 150mm, Quantity 2 pack							
	Viewing Test Tube - Protects copper strip during inspection or storage, Quantity 2							
	ASTM Copper Strip Corrosion Standards - Colored reproductions of tarnished strips encased in a plastic plaque, Quantity = 1							
	Silicon Carbide Paper, FEPA Grade, 220 grit - For polishing of copper strips prior to testing - Pack of 50 sheets, Quantity 1							
	Silicon Carbide Grain, FEPA grade, 150 grit - For final polishing of copper strips prior to testing - 1 lb. package Quantity = 1							
	250-000-12F ASTM 12F Thermometer. Range: -5 to +215°F							
	Polishing Vise - Holds copper strip firmly in place without marring the edges. Stainless steel, mounted on a composition base, Quantity = 1							
	Multi-Strip Polishing Vise, capable of holding four strips at a time Quantity = 1							
	250-000-12C ASTM 12C Thermometer. Range: -20 to +102°C							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With certificate of distilled water by the equipment							

	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
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	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
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	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.06	Automatic Cloud and Pour Point Analyzer							
1. Description/Scope	Cold flow properties, such as cloud point and pour point, indicate how petroleum products behave at low temperatures. The test specimen is cooled at a specified rate and measured periodically. The highest temperature at which a cloud is first detected at the bottom of the test jar is recorded as the cloud point. The lowest temperature at which movement of the specimen is detected is recorded as the pour point.							
	Fully Automatic determination of cloud point by Optical Detection, determination of pour point via the Automatic Tilt Method							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	Conforms to the specifications of: ASTM D5771, D5950 Excellent Correlation to: ASTM D97, D2500, D5853, D6074, D6158; ISO 3015, 3016; IP 15, 219; DIN 51597; FTM 791-201; NF T 60-105; JIS K2269							
6. Technical Specification								
	High Performance							
	Wireless Cloud Point Head							
	Wireless Pour Point Head							
	Integrated Cooling System							
	Automatic Calibration by means of 10-point RTD Calibration, Sample Calibration, and Jacket Calibration							
Detection:	Cloud Point: Optical Detection							
	Pour Point: Automatic Tilting							
Cooling:	Internal Cooling System							
Temperature Range:	(-105 °C to +50 °C)/ (-157 °F to +122 °F)							
	Temperature Accuracy: ± 0.1 °C							



Tilt Interval:	1 °C or 3 °C as per test method (User defined for custom method 1 °C to 5 °C)							
Display:	10.4" Color Touch Screen							
Password Protection:	Multi-level password capability							
Traceable Certified reference material for Cloud and pour point	1. Cloud Point CRM @ -5°C, that meets ASTM D2500, ISO 3015, Quantity 255ml x3 2. Pour Point CRM @ -15 and -25°C, that meets ASTM D97 and ISO 3016, Quantity 255ml x3 for each							
Industrial Touch Screen User Interface	10.4-inch Integrated Color Touch Screen							
Software Capabilities, USB & Network Connections	Standard test methods are pre-programmed or user-defined test programs can be created							
	Clear graph of temperature vs. time for sample and bath temperatures							
	Results can be easily searched, viewed on screen, printed, and exported to LIMS							
	4 USB interfaces							
Automated Calibration Features	Internet (Ethernet) Line							
	3 Point Electronics Calibration							
	10 Point RTD Offset Calibration							
	Jacket Calibration							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, Single phase							
6.2. Dimensions	W x D x H, in.(cm): (30x68x40), +/-20%							
6.3. Weight	45kg, maximum							
6.4 Spare parts/Accessories	test jar (Quantity 3), and cork (Quantity 3)							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
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	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							

8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.07	Say bolt and Say bolt Wax Chromometers							
1. Description/Scope	The Say bolt Color test is used for quality control and product identification purposes on refined products having an ASTM Color of 0.5 or less. Products in this range include undyed motor and aviation gasolines, jet propulsion fuels, naphtha, kerosene and petroleum waxes. The Say bolt Chromometer measures color by comparing a column of sample against standard color discs. The Say bolt Wax Chromometer measures color of non-fluid waxes by heating the samples during the test.							
	Conforms to ASTM D156, ASTM D6045 and related Programmable Settings, Touch Screen Technology, On-Screen Warning System, Easy storage and sharing of results, Single Scale Measurement							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	Conforms to the specifications of: ASTM D156; DIN 51411; FTM 791-101; NF M 07-003							
6. Technical Specification								
Color Type	Transparent							
Display	Size: 3.5 inch; Resolution: 320 x 240; Color: 24 Bit (True Color)							
Interfaces	USB							
Internal Storage	> 20,000 readings							
Power Supply	USB 2.0 (mini-USB plug)							
	4 batteries (AA)							
Portability	Portable							
	2 x W100 OG 50mm glass cells							
	2 x W100 OG 50mm glass cells							
	2 x W100 50mm plastic cells							
	2 x glass reference standards							
	2 x 60 mL liquid reference standards (with minimum 2 Years expiry date when deliver)							
	Pot of 4 x AA batteries							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, Single Phase, 5.3A							
6.2. Dimensions	106 x 57 x 210 mm, +/-10%							
6.3. Weight	5 kg max							
6.4 Spare parts/Accessories/ consumables	2 x glass reference standards							
	2 x 60 mL liquid reference standards (with minimum 2 Years expiry date when deliver)							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							

	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.08	Automatic micro–Carbon Residue Tester							
1. Description/Scope	provides safe measurements of petroleum products with a tendency to thermally degrade and form coke under high temperature pyrolyzing conditions.							
	SIMPLE AND EASY: The gravity seal lid is designed to give a perfect sealing and it's very easy to manipulate							
	Accommodates sample sizes from 0.1 to 2 grams (depending on carbon residue content.							
	Accommodates up to 12 samples simultaneously, enhancing laboratory's test productivity.							
	Allows standard sample to be run with every test for verification of test accuracy							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	IN COMPLIANCE: ASTM D4530, IP 398, ISO 10370, GB/T 17144, JIS K2270							
6. Technical Specification								
Oven Capacity	600 ml (approximately)							
Temperature Range	Ambient to 775°C							
Time Control	Multiple programmable steps							
Overnight Test Mode	Continues nitrogen flow for up to 16 hours after cool-down							
	Close proximity to hood for vapor exhaust; access to analytical balance 0.1 mg accuracy							
Displays test status	DATA ACCESS on LED readout for easy viewing							
Safety	Safety High temperature limit-switch with auto shut down and audible alarm; test won't start in over-temperature state.							
	Automatic flow control with internal pressure regulator to maintain constant pressure;							
	pressure gauge in kPa and PSIG scales; pre-test low/high flow check and adjustments;							
	low pressure switch with auto shut down and audible alarm.							

	Nitrogen Requirement 135 to 1000 kPa (20–145 psig); cylinder preferred, approx. 37L (1.3 ft3) per 95-minute test							
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, Voltage selector switch, easily convert: IEC-320 connector for detachable power cord							
6.2. Dimensions	W x D x H = 26 cm x 38 cm x 56 cm, +/-20%							
6.3. Weight	14kg maximum							
nitrogen source	Nitrogen Generator with inbuilt Oil free Compressor							
	Suitable to put the instrument in to operation							
	Purity - ≥99.95% / <0.05ppm NMHC for Nitrogen							
	Inlet Pressure - 40–150 psi							
	Outlet Pressure: Adjustable up to 100 psi							
	Gas Flow: 37L/90min min							
	Air purity/particle - <0.01µm							
6.4 Spare parts/Accessories	1. Connection Hoses - Qty 3 set of hoses 2. Small (2 ml), box of 144 3. Large (15 ml), box of 144 4. Tall (4 ml), box of 144 5. Filtering accessories - Qty - 2 sets							
6.5 Consumables: Carbon Residue Reference Materials	1. Low Carbon #1, 0.3% Carbon, Quantity 3 pack 2. Low Carbon #2, 2.4% Carbon, Quantity 3 pack 3. Medium Carbon, 10.6% Carbon, Quantity 3 pack 4. High Carbon, 24.1% Carbon, Quantity 3 pack 5. Carbon Residue Reference Samples: C-18-C40, Qty - 1L 6. CRM Diesels: Heating oil, light; Diesel fuel; Gas oil - Qty 1L from each							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							

Item. 01.09	Portable Fuel Analyzer for Gasoline, Diesel, Jet Fuel and Biofuel Blends							
1. Description/Scope	A high speed, compact and robust FTIR fuel analyzer for the comprehensive and automatic measurement of gasoline, jet and diesel fuels. The analyzer is configured to measure more than 100 fuel parameters and components for fuel blending, for quality inspection and to check compliance with fuel specifications							
	Fuel analyzers allow a comprehensive analysis on fuel quality. Octane Number, Octane Boosters, MMT, Benzene, Oxygenates, Aromatics, Cetane Number, Cetane Improver, Density, Distillation and Vapor Pressure are analyzed within minutes. Compliance with Oxygen, Benzene, Ethanol or FAME limits can be assessed easily, fuel contamination and adulteration is readily identified.							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5. Test Method & Verification Standards	ASTM D7153, D5845, D6277, D7777, D7806; EN 238, EN 14078; ISO 15212 Property Prediction Based on: ASTM D56/D3828, D86, D323, D445, D613, D1319, D1322, D1840, D2386/ D2699, D2700, D3948, D5191, D6371, D6378, D6379; ISO 3405, 5163, 5164, 5165; EN 13016;							
6. Technical Specification	Portable FT-IR Fuel Analyzer • Laser- and Temperature Regulated System • Superior Resolution • Advanced Chemometrics • 10" Full Color Touch Screen • Full Network and LIMS Integration							
Scope of measurements	100+ Fuel Parameters Analyzer: • Oxygenates (ASTM D5845) • Aromatics, PNA and Benzene (D6277, EN 238) • Biodiesel (FAME) Content (EN 14078, D7806) • Octane Booster and Cetane Improver • Anilines • Total Aromatics, Olefins, Saturates, Oxygen • Octane Number: RON, MON, AKI							
	• Cetane Number, Cetane Index • Distillation and Vapor Pressure • Drivability, Vapor Lock and VOC Analysis • Built-In Temperature Regulated Density • Jet Fuel: Flash-, Smoke-, Freezing Point, etc.							
temperature Stability	±0.1°C (±0.2°F)							
Sample Volume	Less than 25 mL							
Scanning Time	80s (Multiple Scans)							
Spectrometer	Temperature and Laser Regulated, 2+1 Cell-FTIR							
Density Measurement	Temperature Regulated Oscillating U-Tube Cell							
Units of Measurement	v%, m%							
70+ Gasoline Parameters with measuring Range	RON :70 - 110							
	MON: 65-105							
	AKI:67-107							
	Distillation: IBP, T10, T50, T90, FBP							
	Evaporation: E70, E100, E150 (°C), E200, E300 (°F)							
	RVP & DVPE:40 - 105 kPa							

	Density: 0 - 3 g/cm3							
	Precision (Density): r.s.d. = ± 0.0005 g/cm3							
	Drivability Index							
	VOC Emissions Calculator							
	Vapor Lock Index (VLI)							
	Unlimited User-Defined Parameters							
Aromatics measuring range	Benzene: 0 - 10 m%							
	Toluene: 0 - 20 m%							
	m-Xylene: 0 - 20 m%							
	o-Xylene: 0 - 20 m%							
	p-Xylene: 0 - 20 m%							
	Ethyl benzene: 0 - 20 m%							
	Propyl benzene: 0 - 20 m%							
	Mesitylene: 0 - 20 m%							
	Durene: 0 - 20 m%							
	Pseudocumene: 0 - 20 m%							
	2-/3-/4-Ethyl toluene: 0 - 20 m%							
	Other Aromatics: 0 - 20 m%							
Oxygenates measuring Range	MTBE, TAME, ETBE, DIPE, Iso-propanol, other oxygenates; 0 - 20 m% for each							
	Methanol: 0 - 15 m%							
	0 - 40 m%							
	2-Butanol, tert-Butanol, Acetone: 0 - 25 m% for each							
	Sec-Butyl acetate, Iso-Butyl acetate, Dimethyl carbonate, Dimethoxymethane: 0 - 10 m% for each							
Octane Boosters Measuring range	MMT/CMT (mg/l): 0 - 10,000							
	Manganese (MMT): 0-2500							
	DCPD: 0 - 15 m%							
	Nitromethane: 0 - 9 m%							
Others measuring range	Cyclohexane: 0 - 100 m%							
Anilines Measuring range	Aniline, N-Me-Aniline, N, N-Dimethylaniline, m-Methylaniline, o-Methylaniline, p-Methylaniline: 0 - 5 m% for each							
Total Parameters measuring Range	Total Oxygen: 0 - 12 m%							
	Total Aromatics: 0 - 80 m%							
	Total Olefins: 0 - 80 m%							
	Di-Olefins: 0 - 20 m%							
	Total Aniline: 0 - 5 m%							
	Total Esters: 0 - 5 m%							
20+ Diesel Parameters measuring ranges	Cetane Number: 20 - 80							
	Cetane Index: 20 - 80							
	Kinematic Viscosity @40°C: 0 - 10 mm2/s							
	Dynamic Viscosity @40°C: 0 - 10 mPas							
	CFPP: -50°C to +20°C							
	Distillation / Recovery: IBP, T10/50/65/85/90/95, FBP, R250, R350							
	Density: 0 - 3 g/cm3 (r.s.d. = ± 0.0005 g/cm3)							
Components Measuring range	Total Aromatics: 0 - 80 m%							
	Poly Nuclear Aromatics: 0 - 50 m%							
	Cetane Improver: EHN, IPN: 0 - 10,000 ppm							
	Biodiesel (FAME, FAEE): 0 - 40 v%							
15+ Jet Fuel Parameters properties measuring range	Flashpoint: -20°C to +100 °C							
	Freezing Point: -80°C to +20 °C							
	Kinematic Viscosity @ -20°C: 0 - 10 mm²/s							
	Distillation: IBP, T10/ 50/90/95, FBP, E10/50, R200							
	Smoke Point: 0 - 1000 mm							
	Total Aromatics: 0 - 40 m%							
	Naphthalene: 0 - 5m%							
	MSEP: 60 - 100 %							
	Density: 0 - 3 g/cm3 (rs.d.= 0.0005 g/cm3)							
	Biodiesel (FAME): 0 - 0.12 m%							

Display	Biodiesel (FAME): 0 - 0.12 m%							
Interfaces	2x USB, 2x LAN							
Software	works with the following OS: Microsoft® Windows® 10, 64 bits, SP1 or higher.							
	RAM: 4 GB, 64 bit							
	CPU: min. i5, 4th generation, 1 GHz							
	Free disk space: 1 TB							
	Display: optimal is Full-HD (1920 x 1080)							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, 130 W (field application with DC adaptor for 12 V vehicle battery)							
6.2. Dimensions	(W x D x H) 293 x 390 x 280 mm, +/- 20%							
6.3. Weight	15kg, maximum							
6.4 Spare parts/Accessories	All accessories serve for 3 years minimum							
	Certified reference materials for diesel fuel, and petrol							
	Anti-vibration Platform							
	High-performance lithium-ion battery with power supply							
	Vehicle Adapter							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 5-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.10	Automatic Thermal Oxidation Stability tester							
1. Description/Scope	Used to test Jet fuel thermal oxidation							
	Reducing exposure to fuel by flushing it at the end of the test; keeps test section dry during disassembly, sample test area with protection shields and enclosed sample and quick fittin waste glass.							
	Automating traditionally time-intensive manual activities, such as pump priming, flow monitoring, and sample aeration							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							

	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							



<b>4. Quantity</b>	<b>1 Sets</b>							
<b>5.Test Method &amp; Verification Standards</b>	STM D3241, IP 323, and ISO 6249 test methods							
<b>6. Technical Specification</b>								
Sample Capacity	600 mL or more							
Test Temperature	100°C – 380°C							
Pressure Range	0 – 350 mm Hg (automatically bypassed at +250 mm Hg)							
Operating System Pressure Range	500 psig ± 10%							
Fuel Sample Flow Rate Range	1.00 ml/min to 9.99 ml/min							
Flow Accuracy	± 2%							
Pump	HPLC, Single Head, SS, Pulse dampened							
Thermocouple	Type K (Chrome/Alum)							
Thermocouple Temperature Range	0°C to +500°C							
Test Time Range	Programmable 4 to 600 minutes							
Fuel Aeration Timer	6 minutes							
Aeration Flow Rate	1.5 L/min							
Coolant Flow Rate	38 L/hr. (10 Gal/hr.)							
Ambient Operating Temperature Range	from+10°C to +35°C (D3241 test limited to +15°C to +32°C)							
Relative Humidity	20% to 90% non-condensing							
<b>Safety</b>								
<b>6.1. Electrical and Power requirement</b>	220±10V, 50/60 Hz, Maximum Operating Current 7A/3.5A							
<b>6.2. Dimensions</b>	(W x D x H) 44 cm X 60 cm X 67 cm, +/-20%							
<b>6.3. Weight</b>	60 kg, maximum							
<b>6.4 Spare parts/Accessories</b>	Heater tube and filter kit, Set of 10: 2 each							
	Bottle, Sample/Waste System, 1L: 2each							
	Fuse, 0.5A Fast acting, Nano SMD: 10 each, 5A Fast acting, 5x20mm: 5 each, 2.5A Fast acting, 5x20mm: 5 each							
	Manual Rating training guidelines, Energy Institute: 1 each							
	O-rings, Pack of 25: 1 each							
	Cotton Swab Regular, Pack of 100: 1 each							
	Brush Nylon (1/4" x 2): 1 each							
	Brush Nylon (1-5/8 x 3): 1 each							
	Bushing Insulation kit: 1 each							
	Paper filter 20 count: 1 each							
	Bottle and tube assembly: 1 each							
	Aluminum foil: 1 each							
	Tweezers, Teflon coated: 1 each							
	Rubber Squeeze Bulb: 1 each							
	pan S/S Cleaning: 1 each							
	Bottle Tube 4pcs							
	Extractor Insulator: 1 each							
	Grease silicone: 1 each							
	Kit Prefilter Qty 25: 1 each							
	O-ring Viton 1/8"x1/4"x1/6 25/Pk: 1 each							
	Gloves disposable 100/bx: 1 each							
	Tissues, Paper: 1 each							
<b>7. Authenticated Testimonial/ Credential/ Certificate/ and Document</b>	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							

	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.11	Micro-separometer							
1. Description/Scope	Micro-Separometer is an electro-mechanical instrument used to perform four discrete tests.							
	ASTM Standard Test Methods D3948 (Jet), D7224 (Jet) and D7261 (Diesel) are used to rate water separation characteristics and D4860 (Jet or Diesel) detects and numerically rates free water and particulate contamination.							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards								
6. Technical Specification	completely portable and self-contained unit, operating on an internal rechargeable battery							
	operated at sites where no AC power supply is available.							
	operated while connected to an AC power line (220V AC may be used) via the standard 3 pin IEC power plug (not supplied).							
6 pack - Diesel (ASTM D7261)	Each Test Kit contains vacuum packed expendables that are used to perform a single test.							
	Each coalescer / filter is labeled to identify the type of fuel and the applicable ASTM method to be used.							
	Box Contents:							
	1 x Bottle of distilled water (< 3mL)							
	6 x vacuum sealed six packs containing:							
	Plastic Syringe							
	Coalescer							
	Pipette Tip							
	Syringe Plug							
	Glass Vial							
	Quantity 20 pack							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz,							
6.2. Dimensions	(W x D x H) 46x35x16 cm							
6.3. Weight	15kg, maximum							
6.4 Spare parts/Accessories								
Reference Base Fluid	Surfactant free kerosene (Expected Performance with Reference Fluid containing a Dispersing Agent”, in ASTM D3948)							

AOT Premix 28mL for Micro-separator	a solution of toluene and AOT surfactant and has been produced using the method specified in ASTM D3948, ASTM D7224 and ASTM D7261. (2 years expiry date up on delivery)							
Ground lead	used to ground the syringe drive to the coalescer.							
Micro-separator O-Ring	. Part of the Emulsifier assembly which can easily be checked and replaced							
6 pack - Standard (ASTM D3948)	Box Contents							
	1 x Bottle of distilled water (< 3mL)							
	6 x vacuum sealed six packs containing:							
	Plastic Syringe							
	Coalescer							
	Pipette Tip							
	Syringe Plug							
	Glass Vial							
	Quantity 20 pack							
6 pack - M-Cell (ASTM D7224)	Each Test Kit contains vacuum packed expendables that are used to perform a single test. Each coalescer/filter is labeled to identify the type of fuel and the applicable ASTM method to be used. A container of distilled water is also included in each Six Pack to perform water separation tests. For use with ASTM D7224 - M-Cell testing using Micro-separator							
Bulk 23 Kg bag of 30/60 Mesh Fullers Earth.	Used with the Micro-separator and AOT Premix to chemically validate the instrument.							
	Quantity 1 pack							
Micropipette	Electronics 50 µL Micro Liter pipette for use with Electronics Micro-separator. Quantity 4							
Micro-separator Emulsifier Drive Belt	Micro-separator Emulsifier Drive Belt Suitable for the instruments							
Glass Beaker	1000mL Quantity 3							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates, Safety Datasheet available							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							



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	<b>Ethiopian Conformity Assessment Enterprise</b>	TLD/F6.05-5	
		Copy No:	Rev No:
		0	
<b>Specification</b>		Page No:	Effective date:
		1 of 1	1-Sep-19
<b>Laboratory:</b>	<b>Biochemical Testing Laboratory Directorate, Microbiological Laboratory</b>		
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<b>Approved By</b>	Abel Anberbir		<b>Signature</b>
<b>Contract Ref</b>			<b>Year</b>
			2023

**Lot -2: Description:** - Those categories of instruments are listed under similar LOT, Lot -2 due to instrument function. Those instruments are **common laboratory facilities** which can be used for other products as well but, dedicated for petroleum and petroleum products.

Different manufacturers can produce with minimal capacity and/or scope products characteristic.

**Petroleum Testing Equipments**

ECAE Specification		Bidder Name:					Evaluating Note on Scoring (C = Comply, NC = Not Comply)	
Category of specification	Items and Specification	Specification/Requirement	Warranty	Bidder Offer			Evaluation	Remark
				Lead Time (Days)	Part Number/ Evidence (for applicable & critical component)	Bidder Remark		
<b>Item. 02.01</b>	<b>Karl Fisher Titrator</b>							
<b>1. Description/Scope</b>	Karl Fischer titration is a widely used analytical method for quantifying water content in a variety of products (Solid sample and Liquid samples)							
	Complete system is required with all interfaces.							
<b>2. Unique Identification feature</b>	2.1 Name of the manufacturer of the machine should be provided							
	2.2 Provide Model Number with traceability internet link of the machine at the manufacturer website for verification purpose							
	2.3 The country of origin of the machine shall be declared.							
<b>3. Status of the Instrument</b>	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
<b>4. Quantity</b>	<b>2 Sets</b>							
<b>5. Test Method and Verification Standards</b>	Compatible for ASTM D6304-00 AOAC, EPA, EN, ISO methods							
<b>6. Technical Specification</b>	Titration Method Volumetric							
<b>6.1 Machine Capacity and its Accessory</b>	Reagent Dispensing: Multi-roller Peristaltic Pump							
	Moisture Range :1 ppm to 100% H2O							
	Precision: 0.4 % at 25 mg H2O							
	End-point Potential: Variable							
	Calibration Range :1 to 100 mg							
	End-point Time :1 to 30 second							
	Delay Time :0 to 15 minutes							
	Factor Range :0 to 100%							
	Blank Range :0 to 100 mg							
	Readout: ppm - % - mg							
	Stirring Speeds: 200 to 1400 rpm							
	Interfaces: Balance and Computer							
<b>Environmental factors</b>	Balance Recognition: Compatible with common brands of balance							
	The unit shall be capable of being stored continuously in ambient temperature of 0 -50deg C and relative humidity of 15-90%							
	Thu unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of 80%. Shall meet IEC-60601-1-2 :2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility. Or should comply with 89/366/EEC; EMC-directive.							
<b>6.2 Size, Testing Area and Weight (ergonomic)</b>	dimensions and weight of the instrument to be specified							
<b>6.3 Electrical and power</b>	Power input to be 220-240VAC, 50Hz							

Power Consumption	Voltage corrector/stabilizer of appropriate ratings meeting ISI Specifications. (Input 160-260 V and output 220-240 V and 50 Hz)							
6.4 Spare part	Required accessories, cables, software, manuals, spares, consumables for 2 years shall be supplied with the instrument							
6.5 Consumable	All consumables required for installation and standardization of system to be given free of cost.							
	Reagents and chemical for 2 years shall be supplied with the instruments							
	Including but not limited to the following							
	- coulomat A (pack in 1 liter) - Quantity - 5L							
	- Coulomat CG (pack in 1 liter), Quantity - 5L							
	- syringe with needle.... Quantity 8 needle							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1 All documentations shall be in English and submitted in hard and soft copy.							
	7.2 The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3 The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.3 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be emplaced in the package							
Item. 02.02	Combined Conductivity pH Meter							
1. Description	2 channel instrument that measures up to 7 parameters. With this single bench meter to measure pH, ORP, ISE, conductivity (EC), Dissolved Oxygen, TDS, NaCl percentage and temperature.							
	Utilizing an external temperature probe, pH readings are automatically temperature compensated. To ensure a higher level of precision, pH calibrations are up to five calibration points, chosen from the seven available memorized buffers.							
	This instrument provides GLP capabilities that allows for the storage and retrieval of all data regarding pH, rel mV, EC and NaCl calibration and sample measurement as well as data regarding the maintenance and status of the electrode.							
	With a built-in logging function, measurements are stored in non-volatile memory, and can be transferred to a PC through the USB port. Users can manually log up to 200 records and interval log up to 500 records.							
2. Unique Identification feature	2.1 Name of the manufacturer of the machine should be provided							
	2.2 Provide Model Number with traceability internet link of the machine at the manufacturer website for verification purpose							
	2.3 The country of origin of the machine shall be declared.							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	2 Sets							
5. Technical Specification	pH Range: (-2.00 to 20.00) with 0.001 resolution							
	ISE & ORP: 0.1 mV (±999.9 mV)							

	TDS: 0.01 ppm;							
	NaCl: 0.1% NaCl							
	Temperature: 0.1 °C							
5.1. Accuracy at 20°C	pH: 0.002							
	ISE & ORP: ±0.2 mV (±999.9 mV							
	EC: ±1 % reading (±0.05 µS/cm) over full range							
	TDS: ±1% of reading (±0.03 ppm over full range)							
	NaCl: ±1% of reading							
	Temperature: ±0.4 °C (excluding probe error)							
5.2. Calibration	pH: up to five-point calibration							
	EC: two-point calibration; one point slope calibration; six conductivity calibration point: 84.0, 1413 µS/cm; 5.00, 12.88, 80.0, 111.8 mS/cm; one point offset: 0.00 µS/cm							
	NaCl: one point with standard prob							
5.3. Probes	pH: glass body pH electrode with BNC connector and 1 m (3.3') cable shall be included							
	EC: platinum four ring conductivity/TDS probe with built-in temperature sensor and 1 m (3.3') cable shall be included							
	Temperature: temperature probe with 1 m (3.3') cable shall be included							
	Relative mV Offset: ±2000 mV							
	Temperature: manual or automatic from: -20.0 to 120.0 °C (pH range) -20.0 to 120.0 °C (EC range) (which can be disabled on conductivity range to measure actual conductivity)							
	Compensation: automatic temperature compensation for EC, TDS, PH whenever needed							
	PC Connectivity: Via USB and/or RS 232							
	Log on Demand: 200 records							
	Log Interval Feature: 500 records; 5, 10, 30 sec and 1, 2, 5, 10, 15, 30, 60, 120, 180 min stability logging							
5.4. Power requirement	220±10V, 50/60Hz main supply and suitable adaptor for the offered PH meter							
	Environment: 0 to 50°C (32 to 122°F); RH max 95% non-condensing							
	Dimensions: 235 x 218 x 108 mm (9.2 x 8.5 x 4.2") +/- 20%							
	Weight: 1.3 Kg (2.9 lb.); kit with holder 2.1 Kg (4.6 lb.)							
5.5. Accessories	For each pH meter the following accessories should be included:							
	4-Ring Platinum Potentiometric EC/TDS Probe other than standard offer							
	Refillable, PH electrode							
	Combination pH Electrode for the Laboratory and Beer Testing, BNC Connection							
	12880 µS/cm EC Solution, 500 mL Bottle x 2							
	1413 µS/cm EC Solution, 500 mL Bottle x 2							
	84 µS/cm EC Solution, 500 mL Bottle x 2							
	80000 µS/cm EC Solution, 500 mL Bottle x 2							
	111800 µS/cm EC Solution, 500 mL Bottle x 2							
5.6. Additional	The pH meter should be supplied with:							
	pH Electrode, Conductivity/TDS Probe, Temperature Probe, Electrode Holder, pH 4.01 Buffer Solution Sachet, pH 7.01 Buffer Solution Sachet, Electrolyte Solution, 30 mL, 12VDC Adapter							
	Instruction Manual in English language							
	Calibration Certificate							
6. Type of Software for Testing and Reporting and its License	comply with Title 21 CFR Part 11 (or similar) guidelines.							
6.1 Hardware Capacity, Monitor specification and Connectivity feature	Enhanced data management control, remote access capabilities, and long-term electronic archiving.							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1 All documentations shall be in English and submitted in hard and soft copy.							

	7.2 The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.2.1 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.2.2 In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.2.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.2.4 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be emplaced in the package							
Item. 01.03	Viscometer							
1. Description/Scope	1.1. measures from jet fuel to wax, without changing the capillary Down to -20 °C without counter-cooling							
	Fast heating and cooling rates of up to 20 °C/min. provides a wide measuring range. Optimum precision is specified for the works adjustment range. Special adjustments - either for a low or a high temperature range - or calibration correction points for exact single temperatures customize the instrument for specific applications.							
	1.2.for all samples – from jet fuel to wax.							
	Cooling down to -20 °C without external counter-cooling, Rapid heating and cooling rates (up to +20 °C/min.)							
	Typical sample volume for manual operation: 5 mL suitable for transparent and opaque samples. Samples must be free of particles > 200 µm and free of magnetic particles. Ideally suited for all petrochemical samples (from jet fuel to heavy fuel oil), but also wax or natural oils.							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	Compliant with ASTM D396, ASTM D975, ASTM D1655, D2880, D3699, D6158, D6751, D6823, and many more standards							
6. Technical Specification								
Viscosity measuring range	0.2 mm²/s to 30,000 mm²/s							
Density measuring range	0 g/cm³ to 3 g/cm³							
Temperature	from - 60 °C to +135 °C (-76 °F to +275 °F)							
Viscosity repeatability	0.10%							
Viscosity reproducibility	0.35%							
Temperature repeatability	0.005 °C (0.009 °F)							
Temperature reproducibility	0.03 °C (0.054 °F) from +15 °C to +100 °C							
	0.05 °C (0.09 °F) outside this range							
Sample volume min. / typical	1.5 mL / 5 mL							
Solvent volume min. / typical	1.5 mL / 6 mL							
Max. sample throughput	33 samples per hour							
	Chemical upgrade kit							
Data memory	1,000 measurement results							
HID (Human Interface Device)	10.4" touchscreen, optional keyboard, mouse, and 2D bar code reader							
Interfaces	4 x USB (2.0 full speed), 1 x Ethernet (100 Mbit), 1 X CAN bus, 1 x RS-232, 1 x VGA							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz, 250 VA max.							
6.2. Dimensions	(W x D x H) 33 cm x 51 cm x 23.1 cm +/- 20%							

6.3. Weight	60kg, maximum							
6.4 Spare parts/Accessories	full Accessories for two years							
	Magnetic particle trap (MPT), Quantity = 2							
	Hot filling attachment (HFA), Quantity 2							
	Syringes							
	5 ml and 10 Lure (100 pcs.) 10 pack for each							
	Angular screwdriver torn (Quantity 1)							
	Density standards in ampules 10 pack							
	Heated sample changer							
	Magnetic particle trap							
	Hot filling attachment							
	HOSE CLAMP DMIN 8,8 DMAX 9,3							
	DRYING CARTRIDGE							
Consumables	Density Standard Dodecane 1x10ml, Quantity 2 pack Density Standard Oil 30 cSt @40°C 1x10ml, Quantity 2 pack							
	CRM Viscosity (500 ml), Quantity 4 pack							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or Equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 02.04	Potentiometer titrator							
1.Description/ Scope	For the determination of total Acid Number (TAN), Total Base Number (TBN							
	Endpoint Determination single equivalence point (1st or 2nd derivative) or fixed pH/mV value							
	Potentiometric Titrations acid/base (pH or mV-mode), redox, precipitation, complexometric, non-aqueous, ion-selective, argentometric							
2. Unique Identification feature	2.1 Name of the manufacturer of the machine should be provided							
	2.2 Provide Model Number with traceability internet link of the machine at the manufacturer website for verification purpose							
	2.3 The country of origin of the machine shall be declared.							



3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	3 Sets							
5. Test Method and Verification Standards	5.1 conform ASTM D664, D2896, D3227, D4739							
6. Technical Specification	pH Range: -2.00 to 20.00							
	pH Resolution: 0.01							
	pH Accuracy: ±0.01 at 25°C							
	pH Calibration minimum three-point calibration							
	mV Range: 0.0 to 2000.0 mV							
	mV Resolution: 0.1 mV							
	mV Accuracy: ±0.1 mV at 25°C							
	mV Calibration single-point offset							
	With temperature sensor							
	Temperature Range: -20.0 to 130.0°C							
	Temperature Resolution: 0.1°C							
	Temperature Accuracy: ±0.1°C							
	Temperature Compensation manual or automatic							
	Display: Minimum 5.7" backlit color LCD with 640 x 480 pixels resolution							
	Programmable Stirrer with 200 to 2500 rpm, resolution 100 rpm							
	Burette Sizes: Interchangeable 5, 10, 25 and 50 mL							
	Burette resolution: 1 µL							
	Accuracy: ±0.1% of full burette volume							
	Operating Environment: 10 to 40°C, up to 95% RH, non-condensing							
	GLP Conformity instrumentation data storage and printing capabilities							
6.1 Size, Testing Area and Weight (ergonomic)	Dimensions							
(L x W x H)	(390 x 350 x 380) mm +/- 20%							
Weight:	8 - 12 kg							
6.2 Electrical and power requirement	6.2.1 Mains supply of 220±10V single phase and frequency shall be 50/60 Hz							
6.3 Calibration Related Features	6.3.1 Calibration certificate at least at 5 points (of the full range)							
6.4 Spare part	pH electrode, reference half-cell electrode, ATC temperature probe, stirrer probe							
	List and quantity of all necessary spare part that serve for two years after commissioning shall be declared							
6.5 Type of Software for Testing and Reporting and its License	Stored Results: Minimum 100 method							
	User Management: Multiple Users with Password Protection of Settings							
	Result display: PDF Reports							
	Stored Methods: Minimum 60 method							
6.6 Hardware Capacity, Monitor specification and Connectivity feature	Peripherals (Rear) connections for VGA display, PC-keyboard, parallel printer, USB device input, RS232							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1 Instrument Language and all documentations shall be in English and submitted in hard and soft copy.							
	7.2 Operation Manual, certificate of electrodes, reference standards and other documents shall be in English							
	7.3 The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1 The bidder must declare to provide at least one year warranty after the warranty card (commissioning).							
	7.3.2 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.3 Calibration certificate at least at 5 points for temperature with traceability evidence.							

	7.3.4 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.5 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
	The bidder shall declare to provide installation and 7.3.6 Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be emplaced in the package							
Item. 02.05	Digital Density meter							
1. Description/Scope	1.1.for the measurement of Density, Relative Density, and API Gravity of petroleum							
	1.2. The fast and accurate alternative to pressure hydrometers and pycnometers							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	complies with the ASTM D4052 Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter and the ASTM D5002 Standard Test Method for Density and Relative Density of Crude Oils by Digital Density Analyzer							
6. Technical Specification								
Density Measuring range	0 g/cm³ to 3 g/cm³							
temperature Measuring range	from -10 °C to 200 °C (14 °F to 392 °F)							
Pressure range	0 bar to 500 bar (7250 psi)							
density measuring accuracy	0.0002 g/cm³							
temperature measuring accuracy	0.03 °C (0.05 °F)							
density Repeatability, s.d.	0.00005 g/cm³							
temperature Repeatability, s.d.	0.01 °C (0.02 °F)							
Reproducibility, s.d. of Density	0.0001 g/cm³							
Digital Resolution	0.00001 g/cm³							
Full range viscosity correction	Yes (at ambient pressure)							
Pulsed Excitation Method	yes							
Minimum sample volume	2mL							
Wetted materials	Hastelloy C276							
Connections	Pressure fittings for metal tubes with 1/8" outer diameter							
Interfaces	4 x USB (2.0 full speed),							
	1 x Ethernet (100 Mbit),							
	1 x CAN Bus,							
	1 x RS-232,							
	1 x VGA							
Software features	One time license fee (No restriction, no annual fee)							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz,							
6.2. Dimensions	(W x D) 510 mm x 330 mm +/- 20%							
6.3. Weight	25kg, maximum							
6.4 Spare parts/Accessories								
	For filling samples with a high melting point, e.g., bitumen, asphalt, waxes, plastics							

Syringe heating accessory with all fittings	Keeps samples heated at up to 200 °C							
	Simplifies filling, sample handling							
LPG-Adapter	Filling device for liquid gases: LPG adapter for DMA							
	Equips your density meter to measure propane, butane, and propane-butane mixtures from various sample containers							
	Installation in less than 5 sec							
	Simple, safe operation							
6.5 Consumable	Injection Adapter with Luer Lock Black							
	Density Standard "Trimethylpentane" 10ml Quantity 5							
	Vial 50mL polystyrene (50 Pcs.) Quantity 5 pack							
	Set of caps D29 (30Pcs.) silicone Quantity 5 pack							
	Set of caps D14 (30Pcs.) Silicone Quantity 5 pack							
	Syringe Holder 5mL, quantity 2							
	Isoversinic Tubing I.D.=2 O.D.=4							
	Versilic Silicone Tubing I.D.=4 O.D.=6							
	Syringes 2 ml LUER (10 PCS)							
	Adapter UNF 1/4"-LUER MALE							
	Vial 12mL glass (100 Pcs.) Quantity 2 pack							
	Viscosity standard with traceable Certificate (100 ml) Quantity 3 pack							
	Density standard with traceable certificate (100ml), Quantity 3 pack							
	Density std Ethanol/Water (~41% ABV) Quantity 3 pack							
	Density standard Ethanol/Water (9% ABV) Quantity 3pack							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With Traceable certificate of all required consumables							
	7.2. The bidder shall submit the documents includes, but not limited, software maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive or compliance equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
9. Delivery Schedule	9.1 Not more than three to four months from the time of the order placement							
Item. 02.06	Digital Refractometer with Circulator water Bath							

1. Description/Scope	Measures % Brix, and Refractive Index scales—suitable for use with transparent or translucent liquids and solids. Temperature compensation automatically corrects measurements within 20°>C in an operating range of 59 to 122°>F (15 to 50°>C)—there's no need for a water bath or correction charts within this range.							
	Automatically corrects measurements for differences in temperature Models 81001-10 and -15 feature user-friendly computerized data handling—RS-232 serial port							
2. Unique Identification feature	Stainless steel-rimmed prism is sealed with solvent-resistant epoxy to prevent damage from harsh chemicals. A focusable eyepiece and dispersion correction prism provide true 589 nm RI measurements. The built-in adjustable illuminator lets you view shadow line easily—eliminating the need for transformers or other types of illumination. Place your sample on the prism, adjust the shadow line (if using the uncorrected scale), focus the image, and press the READ button to see your results on the bright LED display.							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards								
6. Technical Specification	Display: Direct digital readout of refractive index or concentration (% solids or custom scale) and temperature							
	Min Brix Range (%):0							
	Max Brix Range (%):85							
	Min Refractive Index: 1.32							
	Max Refractive Index: 1.7							
	Resolution0.001% (Brix); 0.0001 (RI)							
	Accuracy±0.1% (Brix); ±0.0001 (RI)							
Temperature Measurement	Thermistor mounted in prism assembly							
	Temperature Accuracy±0.1°C							
	Max Temperature Compensation (° F)122							
	Min Temperature Compensation (° F)59							
	Max Temperature Compensation (° C)50							
	Min Temperature Compensation (° C)15							
	Display Type5-digit LED							
Sample temperature control	Fittings on prism assembly for connecting temperature controlled water circulator							
Optical compensation	Dual amici prism compensator for sharp shadow-lines and 589nm (Sodium D line) illumination Dual amici prism compensator for sharp shadow-lines and 589nm (Sodium D line) illumination							
	Include four 1/4" OD ports for water bath hookup, test glass, standard solution (7 mL of 1-bromonaphthalene), a number 4 Allen wrench for scale adjustments, a splash guard, and a dust cover.							
Safety								
6.1. Electrical and Power requirement	220±10V, 50/60 Hz,							
6.2. Dimensions	(W x D x H) 6x10.5x14cm							
6.3. Weight	8kg, maximum							
6.4 Spare parts/Accessories	1. a refractive index test glass, Quantity 2							
	2. 1- Bromonaphthalene, Quantity 2 bottles							
Circulation thermostat	Used for the sample temperature control of Refractometer, digital display							
Temperature range	5–95 °C							
Accuracy of Temperature Control	± 0.1 °C							
Temperature Control Resolution	0.1 °C							
Ambient Temperature Range	5 °C – 40 °C							

Heating Capacity	120 W							
Cooling Capacity at 20 °C	40 W							
Pump Pressure	110 mbar							
Pump Capacity	60 l/h							
Filling Volume	250 ml							
Electrical Data	220±10V, 50/60 Hz,							
Electronic Interface	RS-232 interface							
Device Dimensions (W X H X D)	(W x D x H) 170 mm x 225 mm x 244 mm +/- 20%							
Device Dimensions (W X H X D)	(W x D x H) 170 mm x 225 mm x 244 mm +/- 20%							
weight	10 kg max							
7. Authenticated Testimonial/ Credential/ Certificate/ and Document	7.1. User/Technical/Maintenance manuals to be supplied in English. With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 01.08	Petroleum Colorimeter 220V							
1. Description/Scope	1.1. To determine ASTM color, the sample is compared against standard color discs in the Petroleum Colorimeter.							
	1.2. The ASTM color of petroleum products applies to products having an ASTM color of 0.5 or darker, including lubricating oils, heating oils and diesel fuel oils. (For products having an ASTM color lighter than 0.5, use the Say bolt Chromometer.)							

	Single scale, three-field petroleum comparator designed for visual color grading by direct comparison between the sample and colored glass filters housed in test discs conforming to the chromaticity coordinates of ASTM D1500. The sample and two consecutive glasses on the color scale are viewed simultaneously, making it easier to achieve the optimum color match. For rapid color grading within predetermined color limits, the glass standards can be set to the two limiting colors so that it is easy to check that the sample is within tolerance. The tungsten halogen light source is color corrected to CIE Standard Illuminant C, giving constant lighting conditions for color grading, regardless of ambient lighting. A prism brings the three fields together to aid color grading.							
<b>2. Unique Identification feature</b>	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
<b>3. Status of Instrument</b>	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
<b>4. Quantity</b>	<b>1 Sets</b>							
<b>5.Test Method &amp; Verification Standards</b>	Conforms to the specifications of: ASTM D1500, D6074; IP 196; ISO 2049; FTM 791-102							
<b>6. Technical Specification</b>								
	Constructed from ABS (Acrylonitrile Butadiene Styrene) Fire Retardant Plastic							
	Single press of large switch illuminates' sample for one minute (two presses = two minutes, three presses = three minutes).							
	Halogen, long life, light source combined with standard daylight filters ensures full compliance with previous units and consistency from unit to unit							
	Low voltage power supply							
	Disk values are read directly from disks							
	Fully removable sample chamber allows quick cleanup of inevitable spillages							
<b>Safety</b>								
<b>6.1. Electrical and Power requirement</b>	220±10V, 50/60 Hz,							
<b>6.2. Dimensions</b>	(W x D x H) 25x27x18 cm, +/-20%							
<b>6.3. Weight</b>	3kg, maximum							
<b>6.4 Spare parts/Accessories</b>	Glass Color Discs (2)							
	Sample Container (3)							
	Calibration Certificate							
	Replacement Tungsten Halogen Lamp							
	ASTM Color Conformance Filter Set (3 Filters: 0.5, 3.5, 5.0)							
	ASTM Color <0.5 Certified Color Reference Standard 500ml, Quantity 2 pack							
	ASTM Color 1 Certified Color Reference Standard 500ml, Quantity 2 pack							
	ASTM Color 3 Certified Color Reference Standard 500ml, Quantity 2 pack							
	ASTM Color 5 Certified Color Reference Standard 500ml, Quantity 2 pack							
	ASTM Color 7 Certified Color Reference Standard 500ml, Quantity 2 pack							
<b>7. Authenticated Testimonial/ Credential/ Certificate/ and Document</b>	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							

	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
8. Packaging	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							
Item. 02.09	Portable digital Density meter							
1. Description/Scope	Used for the he determination of density, relative density and API Gravity of petroleum distillates and viscous oils							
	Particularly suitable for measuring flammable chemicals.							
	Petrol provides excellent resistance to petroleum samples and fully complies with the ASTM D7777 and IP 559 standards.							
2. Unique Identification feature	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
3. Status of Instrument	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
4. Quantity	1 Sets							
5.Test Method & Verification Standards	Fully complies with the ASTM D7777 and IP 559 standards							
6. Technical Specification								
Measuring range	Density: 0 g/cm³ to 3 g/cm³							
	Temperature: 0 °C to 40 °C (32 °F to 104 °F)							
Accuracy	Density: 0.001 g/cm³							
	Temperature: 0.2 °C (0.4 °F)							
Repeatability, s.d.	Density: 0.0005 g/cm³							
	Temperature: 0.1 °C (0.2 °F)							
Reproducibility, s.d.	Density: 0.0007 g/cm³							
Digital Resolution	Density: 0.0015 g/cm³							
	Temperature: 0.1 °C (0.1 °F)							
Ambient temperature	-10 °C to +50 °C (14 °F to 122 °F)							
Supported measuring units	Specific gravity							


	Alcohol tables							
	Sugar/extract tables							
	API functions							
	H <sub>2</sub> SO <sub>4</sub> tables							
	Ten programmable custom functions (e.g., H <sub>2</sub> O <sub>2</sub> , HCl, CH <sub>2</sub> O)							
Sample volume	2 mL							
Data memory	1024 measured results, 20 measuring methods, 100 sample IDs							
Interfaces	IrDA OBEX/LPT							
Protection class	IP54							
Intrinsically safe	Optional							
Available options	Elongated filling tube							
	Portable thermal printer with IrDA interface							
	IrDA USB adapter							
	Wristband							
	ISO calibration							
Industries	Petrochemical							
	chemical, etc.							
Storage	Storage of up to 250 sample IDs for easy sample identification							
<b>Safety</b>								
<b>6.1. Electrical and Power requirement</b>	Two 1.5 V LR06 AA alkaline batteries							
<b>6.2. Dimensions</b>	140 mm x 138 mm x 27 mm, +/- 20%							
<b>6.3. Weight</b>	0.5kg, maximum							
<b>6.4 Spare parts/Accessories</b>	alkaline 1.5V Batteries, Quantity 4							
<b>7. Authenticated Testimonial/ Credential/ Certificate/ and Document</b>	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
<b>8. Packaging</b>	8.1 Instrument shall be packed using over load and over travel protection built in							



	8.2 Appropriate shock watch label should be in placed in the package							
<b>Item. 02.10</b>	<b>Energy-Dispersive X-ray Fluorescence (EDXRF) for the Petrochemical Industry</b>							
<b>1. Description/Scope</b>	1.1. multi-element analyzer and combines the performance of several single-element analyzers							
	1.2. For S analysis from diesel to crude oils. This also includes continuous process control of higher sulfur levels in refineries as well as norm-compliant Ultra-Low Sulfur (ULS) analysis of final products.							
	With its capability to measure multiple elements simultaneously, including important elements in process control such as Ni, V, Fe and Cl.							
	well suited for the norm-compliant analysis of additives in lubricating oils according to ASTM D6481 and ASTM D7751 that includes the elements Mg, P, S, Cl, Ca, Zn, Mo and Heavy metals. Furthermore, this also includes the analysis of elements in edible oils or palm oils.							
<b>2. Unique Identification feature</b>	2.1. Bidder shall indicate model and brand targeted to offer with manufacturer official web page to cross check with the brochure provided							
	2.2. Country of origin shall be declared							
<b>3. Status of Instrument</b>	It shall be new (Refurbished equipment will not be accepted)/ shall be declared							
<b>4. Quantity</b>	<b>1 Sets</b>							
<b>5.Test Method &amp; Verification Standards</b>	ASTM D7220, D4294, ISO 13032, 20847, 8754, IP 336, 496, 532, complies with the following S international norms: ASTM D7220, D4294, ISO 13032, 20847, 8754, IP 336, 496, 532, JIS K2541-4, ISO 18227, ISO 15309 and ASTM C1255, ASTM C114 and ISO 29581-2							
<b>6. Technical Specification</b>	Elemental analysis in refineries e.g., sulfur analysis of gasoline, diesel biodiesel kerosene, jet fuel, heating oil naphtha, residual oil to crude							
	Further elements on request (e. g. P, Cl, Fe, Ni, V)							
	All refinery applications on one unit							
	ASTM D7220 and D4294 including blanks, set of standards, QC and DC samples							
	Fulfills ISO 13032, 20847, 8754, IP 336, 496, 532, and JIS K 2541-4							
Detection Limit (LLD)	0.5 ppm S at 300 s measurement time							
Measurement Range	3 ppm to 5 % S, combined in one calibration with automated line switch.							
	Higher concentrations on request.							
	One calibration with wide concentration range							
X-ray Tube	50 W, high-power X-ray tube, max. voltage 50 kV, with polarizing High Sense beam path, 30 kV max.							
Detector	High Sense ULS Silicon Drift Detector							
Atmosphere Modes	both Vacuum and Helium mode							
Sample Preparation	Liquid cups, Sample Care cups, Proline and Mylar® foils, pipettes, balance							
	With Emergency Machine Off (EMO), UPS 10 KVA and sample rotation							
Touch Control	Integrated 12.1" TFT touchscreen, multilingual user interface: English, and other languages							
Connectivity	Ethernet port RJ45, 3x USB ports for mouse, keyboard, and printer;							
	HDMI/VGA ports for external display, remote access via TCP/IP							
<b>Safety</b>	DIN EN ISO 9001:2015, DIN EN ISO 14001:2015, 2006/42/EC (CE-certified Machinery directive), 2014/35/EC (Electrical equipment), 2014/30/EC (Electromagnetic Compatibility),							
	Fully radiation-protected system; radiation <1 µSv/h (H*), Compliant to ICRP, IAEA, EURATOM or equivalent international standard							
<b>6.1. Electrical and Power requirement</b>	220±10V, 50/60 Hz, 600VA							
<b>6.2. Dimensions</b>	(W x D x H) 46.6 x 74.5 x 37.0 cm, +/-20%							

<b>6.3. Weight</b>	60kg, maximum							
<b>6.4 Spare parts/Accessories</b>	Glass Capillaries, set of 25, Pack Of 5							
	Liquid Cups Without Foil, Set Of 500, Quantity 2							
	Liquid Cups With 4.0 Micrometer Proline Film, Set Of 256, Quantity 2							
	Liquid Cups With 2.5 Micrometer Mylar Foil, Set Of 256, Quantity 2							
	Polypropylene Foil, 6 Micrometer, 90 M Roll, Quantity 2							
	Kapton Foil, 7.5 Micrometer, 15.2 M Roll, Quantity 2							
	Mylar Foil, 3.6 µm, 100 Carrier Frames, Quantity 10 Pack							
	Proline Foil, 4 Micrometer, 500 Precut Foils, Quantity 5 Pack							
	Proline Foil, 4 Micrometer, 90 M Roll, Quantity 2							
	Proline Foil, 4 Micrometer, 100 Carrier Frames, Quantity 4							
	Liquid Cup Preparation Tool, Assembling, Quantity 10 Pcs							
	Liquid Cup Preparation Tool, Disassembling, Quantity 10 Pcs							
<b>CRM</b>	Sulfur in Diesel Fuel Oil CRM (Nominal Mass Fraction 40 mg/kg) 500 ml, Quantity 2							
	Full-range of Sulfur Standards for XRF. ASTM Methods D2622, D4294, D5453, D7039, D7212, D7220 and others. 100ml each							
	Helium Gas extra pure (Assay – 99.999%), in a cylinder of capacity 50L with compatible regulator. Qty – 1pc							
	multi element Gasoline CRM 500ml, Quantity 5							
<b>7. Authenticated Testimonial/ Credential/ Certificate/ and Document</b>	7.1. User/Technical/Maintenance manuals to be supplied in English.							
	With certificate of distilled water by the equipment							
	7.2. The bidder shall submit the documents includes, but not limited, maintenance and user manual, brochure of the machine, application notes and certificates							
	7.3. The bidder shall submit the following, but not limited to, authenticated Testimonial/ Credential/ Certificate/							
	7.3.1. The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning).							
	7.3.2. In the warranty period, the bidder should declare the frequency of the machine preventive maintenance service.							
	7.3.3 In the warranty period, the bidder should declare to provide the spare parts free of charge.							
	7.3.4 As per Machinery Directive 2006/42EC, Credential evidence of satisfy CE machinery directive compliance or equivalent international directives							
	7.3.5 The bidder must declare to provide at least 2-year warranty after the warranty card (commissioning). In the warranty period, the bidder should declare the frequency of the machine service and spare parts free of charge, after.							
	7.3.6 The bidder shall declare to provide installation and Training for appropriate Period at least for 3 analysts. In addition, the declaration shall indicate SOP (standard operating procedure) that clearly indicate how to operate, troubleshooting, monitoring of functional units and consumables).							
	7.3.7 Evidence on the equipment compliance with applicable health and safety regulations and standards.							
	7.3.8 Willingness of the principal to provide the spares in future at least for ten years (based on client request)							
<b>8. Packaging</b>	8.1 Instrument shall be packed using over load and over travel protection built in							
	8.2 Appropriate shock watch label should be in placed in the package							



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	Ethiopian Conformity Assessment Enterprise		TLD/F6.05-5		
			Copy No:	Rev No:	
Specification				0	
			Page No:	Effective date:	
			1 of 1	1-Sep-19	
Laboratory:	Biochemical Testing Laboratory Directorate, Microbiological Laboratory				
Address:	P.O. Box: 11145, Woreda 6, Bole Sub-City, Addis Ababa, Ethiopia, St. Line 1: 874-1376 Bole			Audit Language	English
	Phone: +251 (0)11-830 2477, +251 (0)116 51 81 95, Fax:+251 (0)11-646 9720				
	Web-site: www.eca-e.com, E-Mail: info-bctl@eca-e.com				
Prepared By	Zerihun Abebe,			Signature	
Approved By	Abel Anberbir			Signature	
Contract Ref				Year	2023

Lot -3: Description: - Those lists are common laboratory glass wares which are used in any laboratories, but in this specific scenario for petroleum and petroleum products.

**Petroleum Testing Equipments**

ECAE Specification		Bidder Name:					Evaluating Note on Scoring (C = Comply, NC = Not Comply)	
Category of specification	Items and Specification	Specification/Requirement	Bidder Offer			Bidder Remark	Evaluation	Remark
			Warranty	Lead Time(Days)	Part Number/ Evidence (for applicable & critical component)			
Item. 01.01	Volumetric flask Glass type (100ml)							
Description:	Volumetric flask for standard preparation or accurate measurement							
Technical Specification:	Glass type ----- Class A glass							
	Capacity ----- 100ml							
	Error limit ----- ±0.02ml							
	Stopper ----- 14/23 NS							
	single point make-up mark							
Quantity:	100 pcs							
Testimonial requirement:	Should have:							
	Certificate of calibration							
Packaging	Instrument shall be packed using over load and over travel protection built in Appropriate shock watch label should be in placed in the package							
Item. 01.02	Volumetric flask, 250ml							
Description:	Volumetric flask for standard preparation or accurate measurement							
Technical Specification	Glass type – Class A glass							
	Capacity – 250ml							
	Error limit – ±0.1ml							
	Stopper – 16/24 NS							
	single point make-up mark							
Quantity	30pcs							
Testimonial requirement	Certificate of calibration							
Packaging	Instrument shall be packed using over load and over travel protection built in Appropriate shock watch label should be in placed in the package							
Item. 01.03	Volumetric flask, 500ml							
Description:	Volumetric flask for standard preparation or accurate measurement							
Technical Specification	Glass type – Class A glass							
	Capacity – 500ml							
	Error limit – ±0.1ml							
	Stopper – 16/24 NS							
	single point make-up mark							
Quantity	30pcs							
Testimonial requirement	Certificate of calibration							
Packaging	Instrument shall be packed using over load and over travel protection built in Appropriate shock watch label should be in placed in the package							

<b>Item. 01.04</b>	<b>Volumetric flask, 1000ml</b>							
<b>Description:</b>	Volumetric flask for standard preparation or accurate measurement							
<b>Technical Specification</b>	Glass type – Class A glass							
	Capacity – 1000ml							
	Error limit – ±0.1ml							
	Stopper – 16/24 NS							
	single point make-up mark							
<b>Quantity</b>	30pcs							
<b>Testimonial requirement</b>	Certificate of calibration							
<b>Packaging</b>	Instrument shall be packed using over load and over travel protection built in							
	Appropriate shock watch label should be in placed in the package							
<b>Item. 01.05</b>	<b>Beaker, Glass law form (different size)</b>							
<b>Description:</b>	Heavy wall Pyrex Glass/Borosilicate glass with approximate graduations and label on spout.							
<b>Technical Specification:</b>	Glass type: Type I or Class A glass, neutral as per USP, EP and JP.							
	Autoclavable, with spout for heavy duty							
	Accuracy: ±5%							
<b>Capacity</b>	100ml, diameter - 50mm							
	250ml, diameter - 70mm							
	500ml, diameter - 60mm							
	600ml, diameter - 90mm							
	Heat resistant for baking dry, up to 450°C							
	Working Temp: 350°C							
<b>Quantity:</b>	50 pcs for each, (100ml, 250ml, 500ml, and 600ml)							
<b>Testimonial requirement</b>	Certificate of calibration and performance							
<b>Packaging</b>	Instrument shall be packed using over load and over travel protection built in Appropriate shock watch label should be in placed in the package							
<b>Item. 01.06</b>	<b>Petroleum sampling tubes- dipping vessel</b>							
<b>Description:</b>	A detachable sampler consisting of a metal or plastic bottle/probe with a weighted base (for quick lowering) and a plug for the bottle. The bottle and the plug are suitably tied to a cord, rope or chain, which makes it possible to take samples from various levels: when the necessary level is reached the plug is opened by a sharp pull or alternative means.							
<b>Technical Specification:</b>	Capacity:1000 ml.							
	for sampling of flammable liquids, the dipping vessel must be made from non-spark producing materials (chrome or nickel-plated brass or stainless steel). The cable or chain, the plug and the manually operated reel must also be made from non-spark producing materials.							
	The dipping vessel and accessories should meet the requirements of EN 13463-1 Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements.							
	applicable for petroleum and other products, incl. dark petroleum products such as heating oils and dark lubrication oils.							
	Organic solvents, thinners, and light petroleum products such as petrol, kerosene, petroleum and light lubricating oils.							
	Water-miscible liquids.							
<b>cleaning and maintenance</b>	Wash with gasoline, then with water, open the stopper and dry at 60 °C.							
<b>Quantity:</b>	3 pcs							
<b>Testimonial requirement</b>	Certificate of performance							
<b>Packaging</b>	Instrument shall be packed using over load and over travel protection built in							
	Appropriate shock watch label should be in placed in the package							

Item. 01.07	Multi-Level Self-Sealing Sampler							
Description:	Applicable to sampling the petroleum products that are in liquid state at the atmospheric pressure and normal temperature (safety temperature of oil) at different depths of oil tanks, vessels, tank trucks, oil tankers and pipelines etc.							
Technical Specification:	Capacity: 1000 ml.							
	brass material, made with one-step forming technology, No welding, No oil leakage.							
	complies to ISO 3170: Petroleum liquids -- Manual sampling, ASTM D4057: Standard Practice for Manual Sampling of Petroleum and Petroleum Products.							
	The sample can be accurately collected at the designated point when sampling in tank, and the oil inlet can be automatically closed after sampling to ensure the purity of the sample.							
Characteristic:	With detachable containers opened at the required depth by a snatch valve which reseals when the container is full; Brass material, no spark, avoid the safety accident caused by electric spark;							
	with 50 m anti-static sampling probe,							
	with anti-static-grounding clip							
	with grounding							
feature	Suitable for collecting fixed-points sample in tank/cans- Making bottle opening and closing manually at designated spot							
	- Stamping and stretching forming							
	- 1.5mm wall thickness							
	- Sampling at up port							
	- C1163 Close Bottle's Stopper Auto after Sampling in tank							
Quantity:	3 pcs							
Testimonial requirement	Certificate of performance							
Packaging	Instrument shall be packed using over load and over travel protection built in Appropriate shock watch label should be in placed in the package							