PARTEX PETRO LTD

(A Sister concern of Partex Group)
Dangarchar, Juldha Union, Karnaphuli
CHATTOGRAM, BANGLADESH

TENDER DOCUMENT
FOR THE PROCUREMENT OF GOODS

Supply, Installation & Commissioning of Laboratory Equipment of Petroleum Products with all ancillaries.
(Single stage two envelope)

Invitation for Tender No. PPL/LP/LT-01/2020
Issued on: 27/10/2020

NOTICE INVITING TENDER

Issuing Office: Partex Petro Ltd, Mohakhali C/A, Dhaka-1212

Tender Document: Details are given below

Last Date & Time of receipt : 21th November 2020 up to 2.00 p.m

Tender Opening Date & Time : 21th November, 2020 at 3.00 p.m

Tenders are invited on behalf of Managing Director, Partex Petro Ltd, Mohakhali C/A, Dhaka for supply and installation of Machineries/equipment for Quality Control laboratory of Partex Petro Ltd situated at Juldha Union, Karnaphuli, Chattogram. Partial bid is also acceptable.

Eligibility of bidder:

Companies should have following :

1. Proven record of supplying such equipments
2. Experience of installation, commissioning, training and after sales service of the machine/equipment.
3. Local agents who are participating onbehalf of foreign manufacturers, they should furnish a certificate from those manufacturers as per **Annexure "D".**
4. Bidders are allowed to bid partially or wholly for the equipments to be purchased.

1.0 DEFINITIONS:

a) "PPL" means "Partex Petro Ltd",Dhaka

b) "The purchaser" means the Managing Director of Partex Petro Ltd acting through the Secretary, Partex Petro Ltd, Dhaka.

c) "The Bidder" means company, individual or firm who participates in this tender and submits its bid.

d) "The Supplier" means the successful bidder supplying the goods and services under the contract.

e) "The Goods" means all the equipment, machinery, more fully described in this document which the supplier is required to supply to the purchaser under the contract.

f) "Letter of intent" means the intention of the purchaser to place the purchase order on the bidder.

g) "The Purchase Order" means the order placed by the purchaser on the

Supplier signed by the purchaser including all attachments and appendices thereto and all documents incorporated by reference therein.

h) The purchase order shall be deemed as "Contract" appearing in the document.

i) "The Contract Price" means the price payable to the Supplier under the purchase order for the full and proper performance of its contractual obligations.

j) "Validation" is a process of testing equipment as per the Generic Requirements in the specification for use by Quality Control Laboratory, Partex Petro Ltd, Juldha Union, Karnaphuli, Chattogram.

k) "FC" means foreign currency.

TENDER DOCUMENT FOR PURCHASE OF EQUIPMENTS (as per Clause 3) FOR Quality Control laboratory, Partex Petro Ltd, Juldha Union, Karnaphuli, Chattogram.

2.0 PARTICULAR OF TENDER

a) Designation and address of Authority inviting tender:	Managing Director, Partex Petro Ltd, 74, Mohakhali C/A Dhaka-1212
b) Place of receiving of tender:	Partex Petro Ltd, 74, Mohakhali C/A, Dhaka-1212.(Bid can be submitted by courier /email at tender@partex.net / directly dropping in Tender Box)
c) Time of opening Commercial Bid/offer:	03.12.2020 at 3.00 p.m (Interested bidders may attend at the time opening commercial offer)
d) Venue of opening tender:	Partex Petro Ltd 74,Mohakhali C/A, Dhaka-1212

3.0 EQUIPMENTS TO BE PURCHASED

(Particulars given below)

	NAME OTHE INSTROMENTS AND THEIR REQUIRED NUMBER
1.	DENSITY METER: ASTM D1298
2.	AUTOMATIC DENSITY METER: ASTM D4052
3.	RELATIVE DENSITY FOR LPG : ASTM D1657
4.	CONSTANT TEMPERATURE HYDROMETER BATH: ASTM D1298
5.	CONSTANT TEMPERATURE HYDROMETER BATH: ASTM D232
6.	VOLATILITY FOR HYDROCARBON: ASTM D1837, D2158
7.	TOTAL VOLATILE SULFUR IN LPG : ASTM D6667
8.	HYDROGEN SULFIDE FOR LPG: ASTM D2420, UOP212
9.	POTENTIOMETER TITRATOR FOR TAN & TBN; ASTM D664, D2896, D3227 & UOP 212(LIQUID)
10.	AUTOMATIC DISTILLATION APPARATUS: ASTM D86
11.	MANUAL DISTILLATION APPARATUS: ASTM D86
12.	MULTI-COLOUR AUTOMATIC COLORIMETER: ASTM D156 & D1500
13.	VAPOR PRESURE FOR HYDROCARBON: ASTM D1267
14.	REID VAPOR FOR HYDROCARBON: ASTM D323
15.	KINEMATIC VISCOSITY METER: ASTM D445
16.	VISCOMETER CLEANING AND DRYING APPARATUS: ASTMD445
17.	AUTOMATIC ABEL FLASH POINT TESTER: IP 170
18.	PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER: ASTM D93
19.	DOCTOR TEST: ASTM D4952
20.	COPPER STRIP CORROSION FOR LIQUEFIED PETROLEUM GASES : ASTM D1838
21.	COPPER CORROSION FOR PETROLEUM PRODUCTS: ASTM D130
22.	OXIDATION STABILITY OF GASOLINE: ASTM D525
23.	BENCH TOP OCTANE & CETANE ANALYZER: ASTM D2699, ASTM D2700 7 ASTM D613
24.	SULFUR IN PETROLEUM BY ENERGY DISPERSIVE X-RAY FLUORESCENCE SPECTROMETRY: ASTM D4294
25.	Lead Gasoline by R-ray Spectroscopy-ASTM5059.
26.	PONA CONTENT BY FIA : ASTM D1319

27.	DETAILED HYDROCARBON ANALYSIS (DHA) WITH AUTO SAMPLER: ASTM D6730
28.	EXISTENT GUM FOR JET A-1 APPARATUS: ASTM D381
29.	CLOUD POINT & POUR POINT APPARATUS: ASTM D97 & D2500
30.	SMOKE POINT: ASTM D1322
31.	AUTOMATIC ANILINE POINT: ASTM D611
32.	FREEZING POINT: ASTM D2386
33.	AUTOMATIC FREEZING POINT APPARATUS FOR AVIATION FUELS: ASTM D5972
34.	HEAT OF COMBUSTION OF LIQUID HYDROCARBON FUELS BY BOMB CALORIMETER; ASTM D4809/ASTM D3338
35.	THERMAL STABILITY –JET FUEL THERMAL OXIDATION TEST (JFTOT) ; ASTM D3241
36.	WATER REACTION OF AVIATION FUELS: ASTM D1094
37.	WATER SEPARATION CHARACTERISTICS OF AVIATION TURBINE FUELS BY PORTABLE SEPAROMETER (MICRO-SEPAROMETER RATING: ASTM D3948
38.	ELECTRICAL CONDUCTIVITY OF JET FUELS: ASTM D2624/IP274
39.	EMULSIFICATION TEST: ASTM D1401
40.	ASH CONTENT: ASTM D482
41.	SEDIMENT IN CRUDE AND FUEL OILS: ASTM D473
42.	CARBON RESIDUE: ASTM D189
43.	LPG SAMPLE BOTTLE: ASTM D1265
44.	WATER CONTENT: ASTM D95
45.	Ph METER:
46.	CONDUCTIVITY / TDS METER:
47.	DRYING OVEN:
48.	PRECISION BALANCE:
49.	UV-VIS SEPECTROPHOTOMER;
50.	SCHILLING EFFUSIOMETER: IP59
51.	PARTICULATE CONTAMINATION IN AVIATION FUELS BY FILTRATION: ASTM D5452
52.	WATER CONTENT: ASTM D 6304
53.	AUTOMATIC LUBRICITY TEST OF AVIATION FUELS BY BOCLE: ASTM D 5001
54-66	Certificate Reference Materials

4.0 TECHNICAL SPECIFICATIONS OF THE ITEMS TO BE PURCHASED:
See attached specification sheet with tender documents**.**

4.1 The fore goings is the basic minimum specifications to be met. Equipment with better Specification/facilities will not be a disqualification, if technical committee accepts.

5.0 VALIDITY OF OFFER:

The offer quoted in the tender should remain valid up to 03 (Three) months from the date of opening of commercial offer.

6.0 TERMS AND CONDITIONS

6.1.1 Bids should be submitted in two-bid system. Part I Technical Bid and part II Commercial Bid. All the Bids will be put in separate cover super scribed as follows:-

a) Part I Technical bid for equipment

b) Part II Commercial bid for equipment

Both the above seal covers shall be put in another cover and super scribed as:

"Two Part Bids for the equipments as per serial number of specification sheet)

6.1.2 Bids technical literature, instruction, and certificate, diagrams etc. Should be in English language.

6.1.3 Each page of the commercial offer must be serially Numbered and dully signed by the responsible person of the tenderer.

6.1.4 Commercial bid should indicate complete breakup of price in foreign currency or local currency.

Terms in the following format **(As per Annexure "C"):**

I. Net CPT (Dhaka Airport) price of the equipment including standard accessories with standard packing for protecting the equipments from damage.

II. List and Price for two years standard spare parts separately as per recommendation of manufacturers.

III. Cost of additional warranty for two years after expiry of mandatory warranty of one year may be mentioned Separately,

which will not be a part of commercial bid for comparison.

IV. Charges for Installation, commissioning & Training

6.2 In the Technical Bids, besides usual stipulation, the following should be clearly mentioned.

a) Each copy of tender should be a complete document and should preferably be bound as a volume. Different copies must be bound separately and should include technical hand out etc.

b) Profile of the bidder must be submitted as mentioned in **Annexure 'E'**. Reference list of supplied equipments & buyers name should be included.

c) Tenderers shall furnish details of technical support system that will be available to the buyer.

d) The tenderers shall clearly indicate the time for supply of equipment after receipt of purchase order.

e) A Certificate from the tenderers to the effect that the equipment/machines are brand new.

f) Detailed technical literature pertaining to the specifications for all equipment and accessories should be enclosed with technical bid.

g) Details of flow of work, flow diagram, individual electrical connecting load and environmental conditions such as temp,humidity etc., required for operation of equipment to be mentioned.

h) Training program proposed to be imparted to our personnel for operation & maintenance with duration of training should be specified.

i) TIN certificate /Vat Registration certificate, Trade License must accompany the tender set (Applicable for local bidders).

j) The successful tenderer(s) is/are not allowed to transfer the tender Documents, purchase order and tender obligation.

6.3 Rejection of Tender:

a) Incomplete tenders/defective tenders/ambiguous tenders are liable to be rejected.

b) Late tenders are liable to be rejected for whatsoever is the reason.

c) Purchaser has right to reject/cancel the tenders partly or wholly without showing any reason whatsoever.

6.4 TRAINING:
Successful Tenderer shall make provision for imparting training at Partex Petro Ltd, Juldha Union, Karnaphuli, Chattogram during Site Acceptance Test (SAT) to:-

1. Trouble shooting & Maintenance for individual item.
2. Operational training for operating staffs

6.5 INSTALLATIONS, ERECTION AND COMMISSIONING:

6.6 The Tenderers shall be responsible for erection, installation and commissioning of the machines/equipment at the destination site, and also for making it fully operational.

The material required for installation such as:-

(a)	Labour	(d)	Operational & maintenance manual
(b)	Consumables	(e)	Instructions of material
(c)	Drawing	(f)	Other tools

shall be the responsibility of the tenderers.

6.7 INSURANCE:
Partex Petro Ltd shall insure all goods supplied under the contract/supply order while establishing LC/ LCs. All consignments are required to be dispatched to Hazrat Shah Jalal International Airport, Dhaka and the insurance cover shall remain valid till arrival of the consignment at factory site. The tenderers who will supply locally will be responsible for delivery directly to factory site.

6.8 WARRANTIES AGAINST QUALITY:

Tenderers shall be fully responsible for the manufacturer's warranty in respect of proper design, quality and workmanship of the equipment/Machines, accessories, etc. for a period of at least one Year mandatory warranty and two years additional extended warranty from the date of successful completion of site acceptance test (SAT) of the system/sub-system. The supplier will furnish a warranty certificate regarding quality as per **Annexure 'A'** along with Technical Bid. The supplier will replace free of cost all the defective material/parts and any other accessory supplied by them under the contract/supply order which is found/noticed defective within the period of mandatory warranty and extended additional 2 years warranty.

6.9 TESTING PROCEDURES:

In addition to manufacturer/tenderer defined tests, Site Acceptance Tests at Quality Control Laboratory of Partex Petro Ltd, Juldha, Karnaphuli, Chattogram shall be carried out through user interaction.

6.10 SITE SPECIFICATIONS:

6.10.1 Each successful Tenderer shall provide 3 sets of parts catalogue, operational & hardware manuals and user guides for each Machine.

6.10.2 The quantity of Machines equipment may increase/decrease at the time of placing of firm Purchase order.

6.10.3 Only the authorized representative of the tenderer with proper authority letter may attend the opening of the Bids in the Office of Partex Petro Ltd, 74, Mohakhali C/A, Dhaka-1212.

6.10.4 Commercial bids of only those tenderers will be opened if their Technical Bids meet the following requirements:

a) The equipment/machines mentioned in the tender meet all the technical specifications.

6.11 LANGUAGE OF THE TENDERER

6.11.1 The Tenderer and all documents and correspondence relating to the tender exchange by the tenderer and the PPL shall be in English.

6.11.2 The PPL reserves the right at the time of award of the contract to Increase or decrease the quantity of goods specified in the schedule.

6.12 LETTER OF INTENT: The procuring entity will notify the successful tenderer by fax/email/confirming in writing by letter that its tender has been accepted. This notification of offer will constitute the formation of contract.

6.13 Signing of Contract Agreement: At same time of issuing letter of intent the procuring entity will send the contract from as per **Annexure-"B"** incorporating the understanding between the parties.

6.14 Within 05 (five) days of receipt of the contract form the successful tenderer shall sign with date the contract form and return it to the procuring entity.

6.15 Corrupt, fraudulent, coercive or collusive practices: The procuring entity reserved the right to cancel the whole tender process even after selection of successful tenderer if it is found that any of the participating

tenderer including the successful tenderer has indulge itself in Corrupt, fraudulent, coercive or collusive practices.

6.16 Procuring entity reserves the rights to accept/reject the tender or cancel the whole process of tender partly or wholly without assigning any reason.

6.17 TENDER EVALUATION CRITERIA:

6.17.1 Procuring entity will award the contract to successful Tenderer whose tender has been complied with both "Technical " and "Commercial" bid.

6.17.2 Conversions of foreign currencies will be considered as per the prevailing rate (from www.xe.com) of the opening date of commercial bid.

7. TERMS OF PAYMENT:

In case of foreign suppliers:

90% payment will be made on presentation of clean shipping documents against 100% LC at sight. And execution of the supply order including successful installation and site acceptance test (SAT) and comprehensive training for personnel at the respective sites after receiving consignee's certification for successful execution of supply order and rest 10% will be made 06 months after getting the certificate from the consignee/buyer on successful smooth functioning of the installed machines/equipment.

In case of local suppliers:
90% payment will be made after delivery of the equipment/machines at factory site against 100% of purchase Order/contracted amount. And execution of the supply order including successful installation and site acceptance test (SAT) and comprehensive training for personnel at the respective sites after receiving consignee's certification for successful execution of supply order and rest 10% will be made 06 months after getting the certificate from the consignee/buyer on successful smooth functioning of the installed machines/equipment. VAT & AIT will be applicable as per rule.

8. FORCE MAJURE:

"Force Majure" means an event beyond the control of the supplier and not involving the supplier's fault or negligence and not limited to acts of the purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

If a force Majure situation arises, the supplier will promptly notify the purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the purchaser in writing the supplier shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force

Majure

9. TERMINATION FOR INSOLVENCY

The Purchaser may at any time terminate the Contract by giving written notice to the Supplier, without compensation to the supplier, if the Supplier becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or effect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.

10. CLARITY OF INFORMATION

Vendors must furnish specifically the information/clarification where sought in terms of tender document. Vague/ambiguous answering against different paras will not suffice and their tender may be treated as cancelled.

11. COST OF TENDERING

The Tenderer shall bear all costs associated with the preparation and submission of its tender and Purchaser will in no case be responsible and liable for those costs regardless of the conduct or out come of the tendering process.

12. PATENT RIGHTS:

The successful Tenderer shall indemnify the procuring entity against all third party claims of infringement of patent, trademark or Industrial design rights arising from use of goods so supplied to the procuring entity.

13. RESOLUTION OF DISPUTE

Any dispute arising out of this tender, during the contract period or completion and whether before or after the termination, abandonment or breach of the contract shall be referred to the arbitrator in Bangladesh in all such cases as per the Bangladeshi Arbitration and Conciliation Act, whose decision shall be final and binding.

14. INTERPRETATIONS AND JURISDICTION

The Contract shall be interpreted in accordance with the laws of the Bangladesh and court at Dhaka shall have the sole jurisdiction in the event of any dispute not referred for arbitration.

Annexure 'A'

WARRANTY CERTIFICATE

We warrant that every thing to be supplied by us hereunder shall be brand new/ fully fit for operating in Bangladesh conditions particularly those prevalent at ----------free from all defects and faults in material, workmanship and manufacture and shall be of the highest grade and quality and consistent with the established and generally accepted standards for material of the type ordered shall be in full conformity with the specification/drawings and shall operate properly. We shall be fully responsible for its efficient operation.

In case of any latent defect or inconsistency due to poor manufacturing/repair& overhaul of the equipment /instrument, or defective supply not conforming to the specifications if observed at the time of final inspection and thereafter 1 year mandatory warranty and 2 years additional extended warranty from the date of SAT, we undertake the guarantee to repair/supply free of cost the defective items up to the final destination and the inland expenses borne by the tenderer

SEAL of manufacturer/supplier Enterprises

Signature……

Name & address of manufacturer/supplier

Dated…….

Annexure 'B'

CONTRACT FORM

THIS AGREEMENT made the _____day of _____, 20

Between [name of Purchaser of the one part and (name of Supplier) of (address of Supplier) (hereinafter called “the Supplier”) of the other part:

WHEREAS the Purchaser invited tenders for certain goods and ancillary services VIZ (brief description of goods and services) and has accepted a tender by the Supplier for the supply of those goods and services in the sum of [contract price in words and figures] (hereinafter called “the Contract Price).

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:

(a) The Price Schedule submitted by theTenderer;
(b) The Schedule of Requirements;
(c) The Technical Specifications;
(d) The General Conditions of Contract;
(e) The Special Conditions of Contract; and
(f) The Purchaser’s Notification of Award.

3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

The parties agree that, in the event of a dispute between them under or in connection with the contract, the mechanisms for the resolution of disputes outlined in the Conditions of Contract shall be followed in the manner specified therein.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered by the said _____ (for the Purchaser)

in the presence of _____[name of witness]

Signed, Sealed and Delivered by the said _____ (for the Supplier)

in the presence of _____[name of witness]

Annexure 'C'

PRICE SCHEDULE FOR GOODS

Name of tenderer

1. Item (With serial no of technical specification sheet)

2. Description

3. Quantity

4. Unit Price (CPT Dhaka Airport)

6. Total price per item (With break up for costs of goods, 2 Years Spare Parts ,installation & commissioning at site, Training) =

Total Amount =_____ (In FC/ BDT)

• Cost of two (2) years extended warranty: _____(In FC/BDT)

Signature of tenderer

Note:

1. In case of discrepancy between unit price and total, these will be adjusted in accordance with the Instructions to Tenderers.
2. Prices and currencies to be in accordance with the Instructions to Tenderers.
3. All items in the Schedule of Requirements must be entered and priced in the appropriate Price Schedule.
4. Price should be quoted in both figures & words. In case of any mistake in the figure, the price in words will be taken as valid quote.
5. The cost of two (2) years extended warranty will not be considered initially for arriving at the total cost of bid. It will not be mandatory for Partex Petro Ltd to opt for two (2) years extended warranty.

However, the rates quoted for the same will be binding upon the bidder incase Partex Petro Ltd decides to go for extended warranty after laps of one (1) year of mandatory warranty.

Annexure 'D'

MANUFACTURER'S AUTHORISATION FORM

[Date]

TO: PARTEX PETRO LTD.

74, Mohakhali C/A, Dhaka-1212

WHEREAS [name of the Manufacturer] who are established and reputable manufacturers of [name and/or description of the goods] having factories at [address of factory] do hereby authorize [name and address of Agent] to submit a tender, and subsequently negotiate and sign the Contract with you for the above goods manufactured by us.

We hereby extend our full guarantee and warranty as per Clause of the General Conditions of Contract for the goods offered for supply by the above bidder against this Invitation for Tenders.

(Signature for and on behalf of the Organization)

Annexure 'E'

PROFILE OF THE BIDDER (To be furnished with the BID)

1.	**Company Profile**	
	Name	
	Address of the registered office	
	Name & Designation of CEO	
	Contact numbers of CEO	
	Nature of Business	
	Years of operations in Bangladesh (If any)	
	Location of offices in Bangladesh (If any)	
2.	**Experience / Credentials**	
	Number of similar units installed in Bangladesh/Abroad	
	List of satisfied customers in Bangladesh & Abroad	
3.	**Service Support in Bangladesh or Abroad**	
	Number of application specialists	
	Location of service centres	
	Number of trained service engineers in Bangladesh, if any	
	Number of trained service engineers for the equipment offered stationed in Bangladesh, f any	

Date: _____ **Signature** _____ **Place:** _____

Name _____ **Company seal:** _____ **Designation** _____

Details Technical Specification for Lab Equipment

Item No.	Description of the Item	Qty.
1.	**Density Meter: ASTM D1298** **Technical Specification:** **1. Hydrometer: 05 Nos. each** • BS 718 Series M50SP Hydrometer at 15°C Density Range: 0.650 to 0.700 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 0.700 to 0.750 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 0.750 to 0.800 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 0.800 to 0.850 • 718 Series M50SP Hydrometer at 15°C Density Range: 0.850 to 0.900 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 0.900 to 0.950 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 0.950 to 1.000 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 1.000 to 1.050 • BS 718 Series M50SP Hydrometer at 15°C Density Range: 1.050 to 1.100 **2. Thermometer ASTM 12C - 10 Nos.** **3. Hydrometer Jar/Cylinder - 5 Nos.** **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

2.	**Automatic Density Meter: ASTM D4052** **Technical Specification:** 1. Accurate density analysis with only 3 steps: sample loading, measurement and cleaning 2. Automatic cleaning reduces cleaning time and consumption of solvents, even for difficult samples 3. Real-time display of test progress, Easy configuration of test methods, Automatic bubble detection 4. Integrated tables for automatic conversions of density output for: API crude oil, refined products and lubricants 5. Test Method: ASTM D4052, ASTM D5002, ASTM D5931 6. Measurement Range: 0 to 3 g/cm3 7. Temperature Range: 0°C to +100°C (32 to 212°F) 8. Pressure Range: 0 to 10 bar (0 to 145 psig) 9. Viscosity at loading temperature: <15000 mm2/sec 10. Temperature Accuracy: 0.01°C 11. Density Accuracy: 0.00005 g/cm3 12. Density Repeatability s.d : 0.00001 g/cm3 13. User Interface: 7-inch Color TFT Touch Screen 14. Sample Loading: Automatic by push piston 15. Sample Keep Warm: Yes 16. Bubbles Detection: Automatic (by pressure) 17. Cleaning and Drying: Automatic (by two solvents) 18. Viscosity Correction :Yes 19. Temperature Compensation: Yes (API conversion acc. to ASTM-D1250) 20. Calibration: Multi-Temp Documentation: Results instant report in g/ml; kg/m3; Rel. Density; °API. 21. Detailed report on local screen; Print-out reports 22. Statistics: Auto calculation of max/min. values; mean and sdt. dev. 23. Built-in Local Memory: 2GB non removable SD card. Up to 40 products with associated specification. Up to 200 test results. 24. Special functions: Pass/Fail Indication; QC chart; Event Log; 2x Measurement 25. Communication Interface: 2 x USB, Ethernet, 1 x RS-232 26. PC Software: Windows based PC software is available for data acquisition, database management, results comparison, run control, flexible LIMS protocols and other functions 27. Ambient Conditions Operation: 10 to 35°C (50 to 95°F) - Humidity: 20 to 85% (not condensing) 28. Power Requirement : 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

3.	**Relative Density for LPG: ASTM D1657** **Technical Specification:** 1. The determination of the density or relative density of light hydrocarbons including liquefied petroleum gases (LPG) having Reid Vapour Pressures exceeding 101.325 kPa (14.696 psi). 2. Test Method: ASTM D1657 3. Tubular chamber made in acrylic resins Ø 50 × 36 mm, L = 440 mm 4. Metallic headers coupled with six stainless steel tie rods 5. Neoprene gaskets 6. Three ¼" pin cocks 7. Mesh safety guard 8. Tested to 15 bar hydraulic pressure 9. Double scale manometer 0-2500 kPa, 0-350 Psi 10. Thermohydrometer ASTM 310H of range 1. Hydrometer (0.500-0.580):6 nos & (0.570-0.650): 4 nos. 2. Thermometer (-15 deg to +45 deg C): 2nos & (-20 deg to +60 deg C): 2 nos. 11. Equipped with inlet, outlet and vapor vents valves for admitting sample and purging cylinder 12. Built-in safety relief valve (set at 200 psi / 1.4 MPa) **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

4.	**Constant Temperature Hydrometer Bath: ASTM D1298** **Technical Specification:** 1. The determination by means of a glass hydrometer of the API gravity of crude petroleum and petroleum products normally handled as liquids and having a Reid vapour pressure (Test Method D323) of 26 psi (180 kPa) or less. 2. Test Methods: ASTM D70, ASTM D71, ASTM D287, ASTM D1298, ASTM D1481 3. Glass tank of about 29 litres capacity 4. Cover with five holes Ø51 mm for 50 × 440 mm test tubes 5. Control unit in painted sheet with digital thermoregulator PID ± 0.1° with over temperature alarm and probe PT100A 6. Motor stirrer 7. Stainless steel heater 8. Cooling coil for working ambient temperature 9. Test tubes blocking system 10. Ø56 cm × 65 cm 11. Power Supply : 220, Vac 50/60 Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**
5.	**Constant Temperature Hydrometer Bath: ASTM D323** **Technical Specification:** 1. A programmable, digitally controlled thermostir unit combines the functions of heater, temperature controller, timer and stirrer. 2. Test methods: ASTM D323, ASTM D1267, ASTM D4953 3. The thermostir unit is equipped with an RS 232 port, a switched output for an external relay, a socket for an external PT100 temperature probe and alarms and cut-outs for low fluid level and over-temperature. 4. The Vapour Pressure Bath is a floor standing water bath specifically designed for the determination of vapour pressure with Vapour pressure cylinders. 5. Accepts up to 6 pressure cylinder assemblies 6. 4 pressure cylinder mounting brackets 7. Temperature range ambient: +5 °C to 90 °C (194 °F) 8. Uniformity better than: ± 0.1 °C @ 37.8 °C 9. Digital temperature control 10. Low fluid level and over-temperature 11. Bath Volume: 80 litres 12. Bath Fluid: Water (De-ionised) 13. Power Supply: 220V AC, 50Hz. **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

6.	**Volatility for Hydrocarbon: ASTM D1837, D2158.** **Technical Specification:** 1. This test method is a measure of the relative purity of the various types of liquefied petroleum (LP) gases and helps to ensure suitable volatility performance. The test results, when properly related to vapour pressure and density of the product, can be used to indicate the presence of butane and heavier components in propane type LP-gas, and pentane and heavier components in propane-butane and butane type fuels. 2. Test Method: ASTM D1837, ASTM D2158. 3. Volatility of Liquefied Petroleum (LP) Gases 4. The presence of hydrocarbon compounds less volatile than those of which the LP-gas is primarily composed is indicated by an increase in the 95 % evaporated temperature. 5. 18/8 stainless steel bath with double wall 6. Copper cooling coil with two ¼" valves 7. Precooling equipment(292mm deep*64mm inner dia) need which include 6m(20ft) length of 4.8mm(3/16-inch) copper tubing.; 8. Armored thermometer (-50 to 5 °C); Graduation weathering tube; 6-14 mesh sized charcoal grains 9. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

7.	**Total Volatile Sulfur in LPG: ASTM D 6667** **Technical Specification:** 1. Compact design, smallest footprint in today's market 2. Short start-up time (less than 15 minutes) 3. Fast and precise measurement of solids, liquids, gases and LPG's 4. Easy to use and intuitive user interface, operation software 5. Test Method: ASTM D6667 6. Fast and easy switching between modules, resulting in high productivity 7. Easy upgrades with autosamplers for solids, liquids, gases and LPG's 8. Fast generation of sample list and application methods with the software 9. Low maintenance, optimal combustion and conditioning of gases results in near to zero downtime 10. Ultra-low detection limit, high stability and reliability due to the temperature controlled detectors and feedback loop 11. Gas Connectors: ⅛" Swagelok 12. Gases: Oxygen 99.6 % (2.6), Argon 99.998 % (4.8) 13. Input gas pressure: 3-10 bar 14. Internal gas pressure: 1.8 bar, adjustable 15. Furnace voltage: Dual zone, low voltage 16. Furnace temp. (max): 1150°C (2102 °F) 17. Furnace cooling: Pulling fan, auto control 18. Sample introduction: Gases and LPG's by GLS 19. Sample size: Gas: 10 mL; LPG: 100 µL 20. Semi-automatic boat/syringe driver: Software controlled, adjustable method file 21. Slider/shutter driver: Software controlled, adjustable 22. Detector Sulfur: Xenon Pulsed UV-fluorescence AFC technology 23. Detector accuracy: Better than 2% CV 24. Detector conditioning: Temperature controlled, adjustable 25. Vacuum pump: Internal 24 Volt DC **26.** Power Supply: 220V, 50Hz **1. Detector Technology:** • Xenon pulsed Ultra Violet-Fluorescence • Detector accuracy better than 2% CV • UV flasher voltage control function that automatically adjusts the flasher lamp intensity resulting in a stable detector output over time. • Lowered flash intensity is automatically detected and electronically corrected. • Lifespan of the UV-lamp must be at least 2 years **2. System Performance:** • Measuring range of 20 ppb up to 10.000 ppm or 1% w/w	**1 Set**

- Limit of detection 10 ppb
- Relative Standard Deviation (RSD) of at least 5% at lowest measuring range
- Linearity of the first order calibration curve must be 0.999 R2 or higher
- Total gas consumption (Ar & O2) maximum 500 mL/min

3. Sample Oxidation:

- Electric Horizontal Dual Zone Furnace, maximum 24 VDC
- Software controlled furnace temperature, adjustable up to 1150˚C Lifespan of the Electric Furnace must be at least 10 years
- Optimum furnace temperature must be reached in less than 15 minutes from Stand-By mode.
- Furnace cooling by pulling fan which reduces shut down duration. Redundant temperature safety mechanism to avoid overheating.

4. Quartz Combustion Tube:

- Including a secondary Oxygen flow that collides with the oxidizing gas stream resulting in more oxidation capacity.
- No usage of catalyst.
- Including dual stage, self-cleaning capturing filters that protect the downstream flow path against soot deposition

5. Sample Introduction:

- Boat / syringe driver standard integrated in footprint of the analyzer, enabling the flexibility to introduce samples by direct injection and boat inlet system
- Direct injection module that automatically creates a leak tight connection with the combustion tube. No usage of manual clamps.

6. Sample Conditioning:

- High temperature cleanable particulate filter frit made of quartz glass for complete removal of particles from the gas stream
- Membrane dryer or Permeation dryer for complete removal of water vapors from the gas stream

7. Analyzer / System:

- Maximum power requirements: 1150 W
- Colour coded front LED that indicates the system status
- Flows can be set and controlled by either Electronic Mass Flow Control or
- Automatic Pressure Control which are capable of maintaining a constant supply of Argon and Oxygen.
- Availability of power save mode to minimize gas consumption, reduce power consumption and increase the life time of the analyzer and its parts
- Quality of gases must be at least: Oxygen 99.6% (2.6), Argon or Helium 99.998% (4.8)
- Future upgradeable with auto samplers for liquids, solids, gas and LPG's without any hardware modifications

8. Auto-sampler for the introduction of gas and liquified petroleum gas samples:

- Combined autosampler for the introduction of both gas samples, as well as liquified petroleum gas samples

	• The autosampler should have a safety lock to automatically prevent unintended removal of the pressurized sample cylinders • By multiple loop injection, it should be possible to create a calibration line from a stock standard fully automated. • The autosampler should be equipped with a gas leakage sensor to detect hydrocarbons and to abort all activity in case of a possible dangerous situation • The operation of the auto-sampler can be done, both via the operation software of the analyzer, as well as via the touch screen of the auto-sampler for easy operation • Colour coded front LED that indicates sampler status • Integrated Audible Alarm that indicates system connection and possible errors • Auto recognition in operating software of the analyzer through USB connection: Plug & Play **Country of Origin: UK/EU/USA/Japan/China/India.**	

8.	**Hydrogen Sulfide for LPG: ASTM D2420, UOP212** **Technical Specification:** 1. **Determination of hydrogen sulfide and mercaptan sulfur in hydrocarbons and oils** The Sulfur Titrator is designed for the determination of sulfur compounds as hydrogen sulfide and mercaptan sulfur in liquid hydrocarbons and oils.The sensitivity of the test is about 4 mg/m³ (0.15 to 0.2 grain of hydrogen sulfide per 100 ft³) of gas. 2. Test Method: ASTM D2420, UOP212 3. Stainless steel cylinder 500 ml with valve 4. Stainless steel tubing with needle valve 5. Water bath with temperature thermostat 6. Glass cylinder 7. Watch glass 8. Stopper 9. Lead acetate test paper 10. Flow indicator 11. Types of result: mg/kg (ppm) for hydrogen sulfide and or mercaptan sulfur formula generator available. 12. Measuring Range: Hydrogen sulfide less than 1 to several thousand mass-ppm and for mercaptan sulfue 3-500 mass-ppm typically. 13. Resolution of display: 0.91 ppm 14. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

9.	**Potentiometer Titrator for TAN & TBN: ASTM D 664, D2896, D3227 & UOP 212 (liquid)**
	
	Technical Specification:
	
	• Test Methods: ASTM D 664, D2896, D3227 & UOP 212 (liquid)
	• **Easy installation**
	As soon as they are connected, Exchange Unit, stirrer and USB compact printer are automatically recognized and configured.
	
	• **Maximum precision thanks to the new measuring input**
	Just as the Titrando, our high-end titrator, is also equipped with a high-resolution measuring interface that guarantees highly precise results.
	
	• **Graphic display with live curve**
	The large display allows for fast and comfortable editing of all the parameters needed for routine operation. After the start, a glance at the live titration curve is all that's needed to keep you informed about the status of the current determination.
	
	• **Mouse or keyboard – choose your favorite!**
	This is the first titrator that can be controlled either via mouse or keyboard.
	
	• **Easy installation**
	Intelligent Exchange Unit with titrant surveillance function
	
	Maximum precision thanks to high-resolution measuring interface
	
	Live curve
	
	Optional USB compact printer
	
	Automation with 869 Compact Sample Changer
	
	• **Intelligent Exchange Unit means more comfort**
	The chip of the intelligent Exchange Unit automatically provides the titrator with all the data (cylinder volume, type of reagent, validity of titer, etc.) that is necessary to carry out an error-free titration. This means that you always titrate under optimal conditions and, for example, do not have to repeat measurements because the determination has been carried out with an invalid titer.
	
	• **USB interface**
	The USB interface of the Titrator accepts a large variety of instruments. With a USB hub, various instruments can be connected simultaneously:
	
	  • Keyboard or mouse
	  • USB compact printer or commercial DIN-A4 USB printer
	  • USB stick for method and data backup
	• **The ideal titrator for routine applications such as:**
		1 Set

	• Aqueous and non-aqueous acid/base titrations • Redox titrations (e.g. iodometry, permanganometry, cerimetry) • Precipitation titrations (e.g. with AgNO3) • Complexometric titrations (e.g. with EDTA) • Photometric titrations with the Spectrosense 523 nm or 610 nm • Titrations with polarizable electrodes (I pol, Upol) • Dosing element: Exchange Unit • Intelligent Exchange Unit with integrated data chip: Yes • Steps per cylinder volume: 10'000 • Operation, dialog : Keyboard and mouse • Dialog language: English. • Stirrer, titration stand: 801 Magnetic Stirrer or 802 Rod Stirrer • pH calibration (5-point): Yes • Endpoint titration (SET) with conditioning: Yes • Monotonic equivalent point titration (MET): Yes • Dynamic equivalent point titration (DET): Yes • Connection of balance, printer, USB keyboard: Via 1 USB Slave Port, • USB mouse, USB stick and barcode reader: RS 232/USB Box (option) • Graphic display with live curve: Yes • Comprehensive GLP/GMP functions: Yes • Method and result export to USB stick: Yes • Manual operation: Measuring, dosing, stirring • Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	

10.	**Automatic Distillation Apparatus: ASTM D86** **Technical Specification:** 1. **Optical Dry Point**: This unique feature for Dry Point Detection eliminates the need for an external dry point sensor. It ensures high accuracy and easier handling while keeping operating costs low. Especially suitable for ASTM D850 & D1078 and D86 + dry point tests. 2. **Voc Cold Trap**: Designed to minimize evaporation loss of volatile organic compounds, this unique built-in feature ensures safer surroundings while improving the accuracy and repeatability of distillation results. 3. **Flask Installer**: The new flask holder design ensures easy and correct positioning of the distillation flask for both 125 ml and 200 ml flasks. It ensures always-correct probe positioning in relation to the flask's side arm. 4. **HD Volume Scan:** The second generation Volume Scan is equipped with a HD CCD camera that provides two times the precision and accuracy of its predecessor in the former distillation unit. Includes Peltier controlled temperature regulation. 5. **Pre Scan**: The sample temperature and exact volume are measured by the Volume Scan before each test. Receiving chamber temperature is then automatically set to sample temperature to eliminate incorrect volume measurement due to thermal expansion. Subsequently, the actual measured volume is corrected to 100% volume. 6. **Advanced Heat Control** Early-on detection of the distillation behavior and smart internal algorithms ensure real-time accurate heater control. This results in increased IBP/FBP repeatability, "right-in-time" IBP detection and a distillation rate kept smoothly between 4 - 5 ml per min., even with complicated blends such as 20% ethanol-in-gasoline. Automatic final heat is automatically optimized for any type of sample, even for "heavy tail" samples. 7. **Fast Heater Cooling:** 2 powerful fans ensure quick heater and flask cooling after the test is finished (or if the operator chooses to abort the test prematurely, too). 8. **Automatic Heater Lift**: The new automatic heater lift applies the correct upward pressure to the flask and automatically lowers the heater after each test. 9. **Condenser Cooling**: Liquid-free condenser cooling equipped with peltier elements and heat-pipe assisted heat sinks ensures powerful and maintenance friendly operation. **10. Operator support features** 11. **PreScan**: volume and temperature of sample-filled receiver are measured in the receiving chamber before each test. Actual measured volume is then corrected to 100% volume. Receiving chamber temperature is automatically set to sample temperature, provided it is within the method-prescribed limits. 12. **Prepare guide:** guides operator through entire start procedure, from sample storage temperature to heater plate size. 13. **Results validation:** real-time pass / fail test validation against method-prescribed limits such as "time to IBP", "FBP temp.", etc.	**1 Set**

14. **Optimization:** automatically optimizes program settings with fixed In Heat and Final Heat settings after first distillation test.
15. **Flask Installer:** ensures easy and correct upright flask positioning for both 125 ml and 200 ml flasks. The vapor probe's height position relative to the flask's side arm is always correct thanks to the vapor probe design in combination with the strict flask dimensions.
16. **Heating control:** Multi-parameter-based algorithm calculates and applies the required heater settings for IBP, FBP and distillation rate control in real-time. Suitable for unknown samples and/or complicated blends such as E20.
17. **Heating system**: Low mass/low voltage heater. 2 user adjustable fans for extra fast cooling after test. Automatic heater lift with correct flask pressure & positioning. Automatic shut-off in case of fire.
18. **Condenser cooling**
19. **Solid state**: based on Peltier elements with heat-pipe assisted heat sinks and silent fans for heat dissipation. No liquids involved. Condenser temperature can be increased during the distillation to deal with "light start / heavy end" products to prevent both evaporation loss and product waxing in the condenser tube. Temperature range: 0 – 65°C. Resolution 0.1°C.
20. **Volume detection:** Smart HD CCD camera for accurate volume measurement. Detects actual bottom of meniscus. Suitable for "smoke producing" products. Each-test automatic calibration of the camera based on calibrated ring marks on receiver cylinder. Resolution: 0.01 ml, accuracy: 0.01 ml, charge volume: 0-105%.
21. **Receiving chamber:** Built-in drop deflector. Cooling: similar to condenser cooling. 1 sensor for receiver chamber temperature and 1 sensor for sample temperature. Automatic lift moves receiver cylinder up to be sealed at the top, where a small hole ensures exposure to atmospheric pressure. A small tube, laid along the condenser tube and connected to this hole, acts as "VOC Cold Trap", preventing vapors from escaping the receiver (loss). At the end of this tube a VOC extractor can be connected dissipate VOC emissions. Temperature range: 0 – 45°C. Resolution 0.1°C.
22. **Residue & Loss:** Various options: automatic prediction, automatic measurement, manual measurement and preset value. Loss correction is automatically applied to temperature readings.
23. **Vapor temperature measurement:** PT-100 class A probe with 10-point calibration data storage and automatic probe ID detection. Calibration certificate standard supplied. True dynamic simulation of ASTM 7 & 8 in-glass thermometer behavior (lag time and emergent stem). Range: 0 – 450°C ASTM / 0 – 500°C absolute. Temperature units: ºC, ºF.
24. **Dry point detection**: Optical Dry Point: built-in IR sensor for automatic detection of the dry point. No dry point probe required. (Conventional dry point probe is still available as option)
25. **Pressure**: Built-in pressure sensor. Automatic correction of temperature results to atmospheric pressure.
26. **Methods**: ASTM D86, D1078, D850, E123, IP195, DIN51751, ISO 3405, GOST 2177,

	JIS K2254 27. **Range**: 70 to 110 kPa, resolution 0.1 kPa. 28. **Pressure units:** kPa, mmHg, mbar, psi, mWc, hPa. 29. **Cetane index**: Function for automatic calculation of cetane index included. 30. **System health:** Automatic quick system health check before every distillation runs to ensure all components are in excellent state. 31. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	

11.	**Manual Distillation Apparatus: ASTM D86** **Technical Specification:** 1. The Distillation unit is a bench-top instrument used to carry out atmospheric distillation of petroleum products and liquid fuels to determine boiling range characteristics. 2. Test Method: ASTM D86, D850, D1078 3. The unit can distil samples from ambient temperature up to 450 °C and consists of an electrically heated distillation enclosure with a cooling fan and an integral condenser. 4. The steel distillation enclosure houses the distillation flask which is supported by a drop-in ceramic support board (accessory) mounted to a platform that is adjustable for height. 5. Quartz enclosed heating elements are also attached to the platform, and are powered by a solid-state energy regulator and calibrated control. 6. A cooling fan is installed in the rear of the distillation unit to reduce cooling time between distillations. A spillage collection tray with outlet is mounted beneath the heaters. 7. The condenser unit is attached to the distillation unit, and may be used with either a static fill of coolant or a laboratory cooling supply. Housed within the condenser unit is a thermally-insulated, stainless steel coolant tank, fitted with a permanently installed condenser tube. 8. A drain tap and an overflow outlet are mounted on the rear of the unit. 9. Three way heat / fan switch 10. Adjustable height platform 11. Toughened glass window 12. Ceramic glass flask support boards 13. High efficiency quartz tube heaters with gold reflectors 14. Observation window 15. Optional back lighting unit for receiver **15.** Power Supply: 220V, 50Hz	**3 Sets**

	Included Accessories • Flask Support Boards B and C • Graduate Cylinder Support Block **Accessories:** **16.** Flasks ---------- B 125 ----------Qty 60 nos **17.** Graduates Cylinder --------- B 100 ----------Qty- 10 nos **18.** Flask Support Boards K45420 B 11⁄2"(3.81) K45430 C 2" (5.1) Qty- 20 nos **19.** Top Silicone Plug, For Type B & C Flasks pk/10 ---------- Qty- 40 nos **20.** Side Silicone Plug pk/10 ----------Qty- 20 nos **21.** Top Silicone Plug, For Type C Flask pk/10----------QTY- 30 NOS **22.** ASTM 2C Partial Immersion –5 to +300°C ----------Qty- 5 nos **23.** ASTM 7F Low Distillation 30 to 580°F----------Qty- 5 nos **24.** ASTM 7C Low Distillation –2 to +300°C----------Qty- 15 nos **25.** ASTM 8F High Distillation 30 to 760°F ----------Qty- 5 nos **26.** ASTM 8C High Distillation –2 to +400°C ----------Qty- 10 nos **27.** ASTM 37C Solvents Distillation –2 to +52°C----------Qty- 5 nos **28.** ASTM 38C Solvents Distillation 24 to 78°C----------Qty- 5 nos. **Country of Origin: UK/EU/USA/Japan/China/India.**	
12.	**Multi-Colour Automatic Colorimeter: ASTM D156 & D1500** **Technical Specification:** 1. An automated spectrometric colorimeter designed for rapid colour analysis of petrochemical products. 2. Test Methods: ASTM D156, ASTM D1500, ASTM D6045 3. Parameters are entered via a menu system, and subsequent testing is initiated by a single key press with results available within 25 seconds. Up to 32 results can be stored in the on-board memory. 4. The instrument can also be controlled and data processed on an IBM compatible personal computer using the software provided. 5. Automatic operation 6. Multiple colour scales including ASTM and Saybolt 7. Rapid measurement < 25 seconds 8. Objective colour measurement 9. RS232 interface 10. Integrated remote calibration 11. Measuring Principle: 9 interference filters 12. Spectral Response: 420 to 710 nm 13. Repeatability: Chromaticity; (x,y) ±0.0004 Transmittance; ±0.5% 14. Measurement Time: Less than 30 seconds 15. Light Source: 5 volt, 10 Watt tungsten halogen lamp CIE Illuminant A, B, C, D65 Observer: 2 °, 10 ° Path 16. Length: 0.1-50 mm	**1 Set**

	17. Data Storage: 100,000 measurements 18. Power Supply: 220V, 50Hz **Accessories:** 19. Whole color Standard-3 units 20. Sample tube & reference tube for Saybolts (3+3 nos) 21. Sample tube & reference tube for ASTM color (3+3 nos) **Country of Origin: UK/EU/USA/Japan/China/India..**	
13.	**Vapor Pressure for Hydrocarbon: ASTM D1267** **Technical Specification:** 1. Used to determine the Vapour Pressure of LPG to avoid exceeding pressure safety limits during storage, handling and use. 2. Test Method: ASTM D1267 3. Pressure Cylinder Tested & UKAS Certified to 6900kPa (1000psi) 4. Stainless steel construction 5. Ullage to cylinder ball valve 6. Fine control bleeder valve 7. Pressure Gauge: Pressures up to 1750kPa (250psi) 8. Division: 25 psi 9. Sub-Division: 0.2psi 10. Accuracy ±1% fsd 11. 150mm dial 12. Mirror scale in kPa and psi 13. 1⁄4 inch BSP fitting 14. Sturdy handle 15. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

14.	**Reid Vapor for Hydrocarbon: ASTM D323** **Technical Specification:** 1. Made from chromium-plated brass with knurled grips for safe handling and a bayonet coupling for quick leak-free connection. The volume ratio between chambers is held to close limits. 2. Test Method: ASTM D323 3. Determines Reid Vapour Pressure of non-viscous petroleum products and volatile crude oil 4. Accurate chamber volume ratio 5. Quick leak-free bayonet connection between chambers 6. Chromium-plated brass construction 7. Pressures up to 180 kPa (26 psi) 8. Hydrostatically pressure tested to 690 kPa (100 psi) 9. REID Pressure Gauge 0 - 200kPa (0 - 30psi) 10. Division: 5psi 11. Sub-Division: 0.2 12. Accuracy ±1% fsd 13. 150mm dial 14. Mirror scale in kPa and psi 15. 1⁄4 inch BSP fitting 16. Liquid chamber: vapor chamber ratio =1:4; 17. Sturdy handle 18. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

15.	**Kinematic Viscosity Meter: ASTM D445** **Technical Specification:** 1. Kinematic viscosity is a key property for fuels and lubricants. Kinematic viscosity is determined by measuring the time it takes for a sample to flow through a glass capillary viscometer at a known constant temperature. Kinematic viscosity is extremely temperature sensitive and as such an accurate stable temperature controlled bath is essential. 2. Test Method: ASTM D445, ASTM D446 3. Most fuel specifications include viscosity at a specified temperature. Viscosity in fuels determines how well the fuel will pump to the engines. For lubricants, kinematic viscosity determines the ability of a lubricating oil to create and maintain lurbcation films between moving parts. Poor lubricant performance causes wear and overheating. Kinematic viscosity measurements enable the calculation of viscosity index. Viscosity index is an important parameter which describes the relationship between viscosity and temperature for a given lubricant. 4. The Bath gives users a high quality, robust solution for kinematic viscosity determinations. Ultra precision temperature stability and uniformity is achieved with an integrated heating and stirring system. All internal components are made of stainless steel construction to ensure long term durability. The large 50 litre capacity ensures minimum temperature recovery time after loading the bath, improving sample throughput. 5. The bath is equipped with a toughened glass front window, easily accessible drain valve, integral back lighting, top plate and provision for reference thermometers and attachments. **Thermostir Plus** 6. The high performance Thermostir Plus is specially programmed for the Bath to achieve the exact temperature stability and uniformity required for kinematic viscosity determinations and other high accuracy calibration procedures. 7. Large colour display showing bath and set point temperatures 8. Preset facility for standard kinematic viscosity temperatures 9. Heating & boost heating temperature control with adjustment setting to 0.01°C 10. Temperature range ambient to 232°C 11. Illuminated bath providing clear visibility 12. Digital display with 0.01 resolution 13. Easy accessible drain valves 14. 50 Litre bath capacity minimizing temperature recovery time 15. Integrated heating and stirring system 16. Stainless steel internal components providing long term durability 17. Two positions for reference thermometers Temperature Stability: ±0.002°C at 40°C ±0.005°C at 100°C, ±0.01°C at 150°C	**1 Set**

	18. Tube Capacity: up to 6 19. Bath Fluid: Oil, silicone fluid or water 22. Power Supply: 220V, 50Hz **Accessories:** 23. **Canon Fensky routine Viscometer** size 150 (03 nos.), size 50 (03 no's), size 75(05 no's), size 100 (05 no's) size 200 (02 no's) & size 300(02 no's) for transparent samples. 24. **Canon Fensky Opaque Reverse flow viscometer** size 200(02 No's), Size 300(02 no's) & size 350(02 no's) for Opaque/dark heavy samples **25.** ASTM 120C Theromomter, 40°C Test Temperature (5 nos.) **26.** ASTM 121C Theromomter, 100°C Test Temperature (5 nos.) **27.** Port Cover-qty (7). **28.** Thermomter holder-qty (2). **29.** Withdrawal bulb-qty (2) **30.** Rubber stopper for viscometer tube pk/12-qty (2 boxes). **Country of Origin: UK/EU/USA/Japan/China/India.**	

16.	**Viscometer Cleaning and Drying Apparatus: ASTM D445** **Technical Specification:** 1. For Viscometer CAPILERY TUBE - ASTMD 445 2. Six tube capacity 3. For all types of capillary viscometers Cleans and dries glass capillary viscometers using solvent and pressurized filtered air. Use for all types of kinematic viscometers. 1. Included SOLVENT CONTAINER with copper pipe and pipe fittings . 2. Included portable compressor **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

17.	**Automatic Abel Flash Point Tester: IP 170** **Technical Specification:** 1. Test Method: IP 170 2. Equilibrium and non-equilibrium tests 3. Automatic set up of test parameters 4. Gas or electric ignition 5. Automatic heating control and flash detection 6. Automatic test results with end of test audible warning 7. Centigrade or Fahrenheit temperature display 8. Automatic barometric correction 9. Temperature range: 5 to 83 °C (-20 °C to 83 °C) 10. Heating: Cartridge heaters Post test 11. Cooling: Fan assisted or circulating liquid / external cryostat 12. Post test cool down time (80°C to 50°C): 45 minutes (fan) 3 minutes (external cryostat) 13. Ignitor: Quick-fit coaxial gas jet / electric hot wire, user selectable (electric hot wire pilot light for gas jet) 14. Temperature probes: Class A platinum resistance thermometers 15. Stirrer speed: 30 rpm 16. Gas supply (gas jet ignitor): Laboratory gas, 3 kPa (0.44 psi) maximum pressure 17. Cooling supply: Water (5 °C and above) Water / ethylene glycol 50/50 (below 5 °C) 125 kPa (18 psi) maximum pressure 18. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

18.	**Pensky-Martens Closed Cup Flash Point Tester: ASTM D93** **Technical Specification:** 1. A tester with an electrically heated cup, adjustable temperature ramp rate, and two speed stirrer 2. Suitable for use with mains gas or Portable Gas Tank A compressed air supply can be attached to the rear of the instrument to allow rapid cooling in between tests. 3. Test Method: ASTM D93 4. Temp. Range: Ambient to 370°C 5. Variable ramp rate 6. Two speed stirrer (120rpm & >250rpm) 7. Forced air cooling facility 8. Procedures A and B 9. Integral two speed stirrer 10. Accelerated cooling 11. Open cup test conversion 12. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

19.	**Doctor Test: ASTM D4952** Graduated Test Tube with stopper size 25ml and size 50ml, ASTM 4952, **Installation, Commissioning & Training:** Should be carried out by your Engineer at PARTEX PETRO LTD. Plant, Chattogram, Bangladesh at free of cost. **Country of Origin: UK/EU/USA/China/India.**	**1 Set**

20.	**Copper Strip Corrosion for Liquefied Petroleum Gases: ASTM D1838** **Technical Specification:** 1. This test method detects the presence of components in liquefied petroleum gases which may be corrosive to copper. 2. Bench top instrument fully made in stainless steel with double chamber insulation 3. Liquid capacity about 46 liters 4. Test Methods: ASTM D1838 5. Controlled by a digital thermoregulator with PT100 A class temperature sensor 6. PID range from ambient to +120°C, resolution 0,1°C 7. Over-temperature light and heating cut-off manually settable 8. Cooling fan for electronic parts, stirrer motor grant homogeneity/uniformity 9. Cooling coil with joints for external cooling source, metal cover with handle 10. Heater range: 0-1000W. 11. Power Supply: 220V, 50Hz **Accessories:** 12. Copper Test strip (10 nos.). 13. Rubber Stoppers for bomb opening: 100 nos. 14. ASTM Copper ship corrosion standards: 2 nos. 15. Silicone Carbide paper, FEDA Grade, 220 grit: pack of 500 sheets: 20 pkt. 16. Silicone carbide grain, FEDA grade,150 grit: 11b packages: 5 pkt. 17. Polishing vise: 3 nos. 18. ASTM 12C Thermometer: -20 to 102°C. **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

21.	**Copper Corrosion for Petroleum Products: ASTM D130** **Technical Specification:** 1. The detection of the corrosiveness to copper of aviation gasoline, aviation turbine fuel, automotive gasoline, natural gasoline or other hydrocarbons having a Reid vapour pressure no greater than 18 psi (124 kPa), cleaners (Stoddard) solvent, kerosene, diesel fuel, distillate fuel oil, lubricating oil, and certain other petroleum products. 2. Test Method: ASTM D130 3. Bench top instrument fully made in stainless steel with double chamber insulation 4. Liquid capacity about 46 liters 5. Controlled by a digital thermo regulator with PT100 A class temperature sensor 6. PID range from ambient to +120°C, resolution 0,1°C 7. Over-temperature light and heating cut-off manually settable 8. Cooling fan for electronic parts, stirrer motor grant homogeneity/uniformity 9. Cooling coil with joints for external cooling source, metal cover with handle 10. Power consumption 0-1000 Watt 11. Power Supply: 220V, 50Hz **Accessories:** 12. Copper Test strip-10 nos. 13. Rubber stoppers for bomb openings-50 nos. **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

22.	**Oxidation Stability of Gasoline: ASTM D525** **Technical Specification:** 1. The Bath is a stainless steel water or oil bath. Temperature controlled by a top mounted thermostir circulator with integral over-temperature and low fluid level protection devices. 2. Test Method: ASTM D525 3. The bath has four test stations. Each test station has a lid with a hook for suspending either a copper corrosion test vessel or a test tube support. A test tube support can hold up to three test tubes. Any combination of copper corrosion vessels and test tube supports may be used 4. One or more of the four lids may be replaced by oxidation vessel. 5. 75mm diameter, oxygen safe pressure gauge with a 0 to 1 380kPa (0 to 200psi) range. 6. Supplied with: 4 lids, mains lead and instruction manual 7. Temperature Range: Ambient +5 to 150 °C 8. Temperature Stability: ±0.1 °C 9. 3 Oxidation Test stations 10. Bath Capacity: 35 Lt. 11. Heater Power: Max. 1500 W 12. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

23.	**Bench Top Octane & Cetane Analyzer : ASTM D2699, ASTM D2700 &ASTM D613** **Technical Specification:** 1. The analyzer is a Windows, tablet-based fuel analyzer featuring an easy to us touch screen display. The analyzer provides accurate analysis of liquid fuel (gasoline and diesel) to help you monitor quality and maximize profitability. Simply place the product to be analyzed into the sample holder, and insert the sample into the analyzer. Once activated in less than a minute, provides an easy-to-read analysis on the large touch screen, and provides a printed result as well. 2. Gasoline calibrations for RON, MON, percent ethanol, and (R+M)/2 3. Diesel calibrations for Cetane Number and Cetane Index 4. Equivalent to ASTM D2699, ASTM D2700 & ASTM D613 5. 16 Wavelengths from 810nm to 1045nm 6. Internal memory for every sample read on analyzer 7. Patented, totally solid state optics -No Moving Parts 8. Touch-screen display 9. Delron sample chamber in aluminum housing for durability and precision 10. Built-in calibration software 11. External communication via USB port 12. Calibration traceable to CFR engine 13. Memory to store specialized calibrations 14. Measurement mode is diffuse transmission 15. Measurement time is normally less than 30 seconds 16. Large 75mm path length and 200ml of sample averaged 17. IR-enhanced silicon detector 18. Sealed two-piece filter tray 19. Built-in printer, and capable of driving an external inkjet printer 20. Power Supply: 220V, 50Hz 21. To be Included Accessories Calibration Software RS232 22. Cable Aluminum Carrying Case Printer Paper Roll (5) Sample Holder (3) Light Cover AA Battery (6) 23. Included Printer paper Roll (10pcs), sample holder (6pcs) and Holder Label (24 pcs). **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

24.	**Sulfur in Petroleum by Energy Dispersive X-ray Fluorescence Spectrometry : ASTM D4294** 1. Intensity of fluorescence radiation of sulphur atoms registered by the gas proportional counter is proportional to sulphur mass fraction in the sample being analyzed. 2. Test Method: ASTM D4294 3. As per the range of measured concentrations it complies with requirements of ISO: 20884:2011 4. Limit of determined sulfur concentrations - up to 5 ppm; 5. Short time of analysis; 6. Easy and reliable operation; 7. Protection against leakage of samples inside the analyzer; 8. Reusable cells do not require constant replacement and can be used for a long time; 9. Printing of reports on the built-in printer; 10. Built-in computer for analyzer control and calculation of concentrations; 11. Automatic compensation of influence by other elements mitigates error of analysis; 12. Analysis in air environment (without helium). 13. High repeatability is achieved by means of high-aperture X-ray optical circuits 14. (X-ray tube power less than 5 W). 15. Sulphur mass fraction determination method: X-ray fluorescence energy dispersive(EDX) analyzer with selective methods 16. Statistics limit of detection, mass, ppm: 3 17. Range of determined sulphur concentrations, ppm: 5-50,000 18. Limit of basic relative error, % : +/-0.3 19. Contrast ratio (ratio of the counting rate in the control sample Mo to the counting rate in the control sample background fluoroplastic): > 200 20. The counting rate in the reference sample of Mo, imp. / Sec > 20,000 21. 1Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/Russia/China/India.**	**1 Set**

25.	**Lead in Gasoline by X-Ray Spectroscopy: ASTM D5059** 1. Analyze $_{11}$Na to $_{92}$U non-destructively 2. EDXRF Spectrometer 3. Test Method: ASTM D5059 4. Solids, liquids, alloys, powders and thin films 5. 50 kV X-ray tube for wide elemental coverage 6. SDD detector for superior resolution and sensitivity 7. Multiple automated tube filters for enhanced sensitivity 8. Convenient built in thermal printer **9.** Power supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/Russia/China/India**	1 set

26.	**PONA Content by FIA: ASTM D1319** **Technical Specification:** 1. Test method: ASTM D1319 2. Determine the total volume percent of aromatic, olefins, and saturates in petroleum fractions with this fluorescent indicator adsorption apparatus. Multiposition air manifold features independently operated gauges, pressure regulators, and ball O-ring joints for individual pressure control at each column. An integrated electric vibration system facilitates the dry gel packing of the columns. 3. six adsorption columns, 40 analyzer tubes, one 1-mL syringe, one 4" (10.2 cm) needle, two gel bottles, connectors, support tip fittings, O-rings, mounting bracket with screws, and handheld UV lamp 4. 3 x clamps for upper & lower joints and spherical connector for air input. UV lamps are included in the assembly. 5. 4 Standard adsorption column (upper part). 6. 4 Standard wall tubing (lower part). 7. 4 Standard wall tubing (lower part) - pack of 24 8. 4 Pressure jauges. 9. 4 Needle valves, 10. 1 Electric vibrator for packing silicagel 11. Certified silica gel with colored indicator (40 g) 12. Included extra 120 pcs analyzer tubes, another 1-ml syringe 13. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

27.	**Detailed Hydrocarbon Analysis (DHA) with Auto Sampler: ASTM D6730** **Technical Specification:** • Test Method upto C14: ASTM D6730 • Full EFC is available for all inlets and detectors. Control range and resolution are optimized for the specific inlet or detector module. • Functional key board with four-line alphanumeric display/ TFT touch Pad, One-button access to maintenance and service modes from the keyboard. • Touch Screen display of all GC and ALS set points at the GC or data system. **1. GC Oven:** • Temperature range: Operation temperature capable of column oven temperature programming from ambient (+5°C) to 450°C. • The column oven should have programming facility for at least 19 ramps and 20 plateau. • The temperature programming rate selectable up to at least 120°C/ min. • Temperature set-point resolution: 0.1°C • Cool down rate 450°C to 50°C within 4.5 minutes or better. • Retention Time Repeatability <0.008% or < 0.0008 min. • Area repeatability < 0.5% RSD **2. Electronic Flow Control (EFC) /EPC for detector as well as injector:** • Resolution: 0.001psi • Split/Splitless Injector with EFC/EPC - 1 No. • Split ratios minimum up to 7,500:1 to avoid column overload. • Splitless mode for trace analysis. • Maximum temperature: 400°C. • EPC range: 0-150 psig **3. Flame Ionization Detector with EFC/EPC:** • Minimum detectable level: < 1.2pg C/s (for tridecane) or better. • Linear dynamic range: 10 to the power • Flame out detection and automatic re-ignition. • 450°C maximum operating temperature. **4. DHA Columns as per ASTM D 6730:** • Column: As per ASTM D6730 **5. Auto Sampler Injector:** • Minimum 16 numbers of vials capacity or better • Modes of operation • Liquid Quoted and Complied • Pre-programmed modes of injection • Auto sampler Syringes for liquid injection, 10Nos.	**1Set**

6. Data Acquisition System:

- DHA software, GC software and PC hardware - 1 No. each
- The software should be a full license version, not the upgrade version.
- The software provided by the vendor should be the original one. The vendor should provide the original software license certificate from the original manufacture.
- Full Analyzer Control including Gasifier, sample inlet valve, injector, column oven, back flush - detector -carrier gas.
- Retention time readability customizable integration event table with time-programming integrator function including peak width, threshold, area reject, area sum, baseline type, enable/disable negative peak, enable/disable integration. Area%, Height%, Norm%, ISTD, ISTD%, ESTD, ESTD%
- Re-calibration with new or averaged response factor and retention times.
- Calibration curve plotting capability.
- Manual Peak integration capability. Multiple Chromatogram overlay.
- Custom Report capability including. ISO 6976 calculation including molecular weight, specific gravity, wobble Index.
- Compliance with current good laboratory practice (cGLP) including method and data audit trails, security access level.

7. PC Hardware for Data Station (Latest Configuration):

- Latest configurations (minimum core i7) compatible with the instrument along with virus protection software.
- 19" LCD/LED color monitor, Optical mouse, LaserJet printers
- The required PC, Printer, gases (H2, He, N2, Air) with regulators for Installation & Commissioning will be supplied by vendor.

8. Consumables and Spare Parts for 500 tests:

1. Vials, Septa, Cap - 500 Nos. each
2. Injector Septa (BTO) - 100 Nos.
3. Linear for split injection - 05 Nos.
4. 50 m Tubing, Tee, fitting -01 No. each
5. Ferrule for Injector - 10 Nos.
6. Nuts for Injector - 10 Nos.
7. Hydrocarbon Trap for Injector - 01 No.
8. PIONA Standard Kit with Certificate (05 Nos. Vial of Paraffin, Isoparaffin, Oliffin, aromatics, and Mix standard) - 01 No.
9. DHA Columns as per ASTM D6730 - 01 No.
10. Oxygen Trap - 01 No.
11. Moisture Trap - 01 No.

Country of Origin: UK/EU/USA/Japan/China/India.

28.	**Existent Gum for Jet A-1 Apparatus: ASTM D381** **Technical Specification:** 1. This test method covers the determination of the existent gum content of aviation fuels, and the gum content of motor gasoline or other volatile distillates in their finished form (including those containing alcohol and ether type oxygenates and deposit control additives) at the time of test. 2. Test Method: ASTM D381 3. Evaporation Bath - Air and Steam Jet, manual instrument composed by: 4. Bench top instrument with metallic case structure painted with anti-acid products. 5. Control panel with: main switch, digital thermoregulatory for bath block temperature reading by means PT100 A class with 0,1°C resolution and precision, heater and super-heater switches, and air/steam mode selector. 6. 2 dedicated inlet lines, 1 for air and 1 for steam both equipped with a manual valve. 7. Aluminum block with 8 test positions with high speed heating elements and built-in super-heater for steam. 8. 8 Jets (one for each test place) fitted with its conical adapters with 500~600 micron screens. 9. Fast heating: 240°C are reached in approximately 8 minutes. 10. Total air flow displayed by a large visibility flow meter with metal housing with range from 2 to 20 mm^3/h. 11. Testing Capacity: 6 sample beakers 12. Maximum Temperature: 475°F (246°C) 13. Temperature Control Stability: ±1°F (±0.5°C) 14. Bath Configuration: machined aluminum block with multiple cartridge heaters 15. Superheater: Superheating chamber and condensate trap constructed of stainless steel Solid state thermoregulator (0-550°F) 16. Included Accessories : Conical Brass Adapters for air/steam jets 17. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

29.	**Cloud Point & Pour Point Apparatus: ASTM D97 & D2500** **Technical Specification:** 1. Cloud point and pour point are indicators of the lowest temperature of utility for petroleum products. The sample is periodically examined while it is being cooled in the cloud and pour point apparatus. The highest temperature at which haziness is observed (cloud point), or the lowest temperature at which movement of the oil is observed (pour point), is reported as the test result. • Suitable for black specimens, cylinder stock, and non-distillate fuel oil • and for testing the fluidity of a residual fuel oil at a specified temperature is described • This test method covers only petroleum products that are transparent in layers 40 mm in thickness, and with a cloud point below 49°C. • Determination if an automotive engine oil is homogeneous and will remain so, and if it is miscible with certain standard reference oils after being submitted to a prescribed cycle of temperature changes • Bench top model made in aluminium with epoxy anti-acid paint • 4 dry clean wells of test with thermometer hole • 4 small stand-by covers • Working temperature: up to -69°C • 1 temperature digital controllers resolution 0,1° • 1 PT 100 probes class A • 1 main switches • CFC free gases • Power Supply: 220V, 50Hz **Accessories:** 4. Test Jar Clear, flat bottom jar with sample height graduation (12 nos.) 5. ASTM 5F Thermometer, range: –36 to +120°F (2 pcs) 6. ASTM 5C Thermometer, range: –38 to +50°C (2 pcs) 7. ASTM 6F Thermometer, range: –112 to +70°F (2 pcs) 8. ASTM 6C Thermometer, range: –80 to +20°C (2 pcs) 9. Cork Disk (5 nos) 10. Foam Sponge Disc (5 pcs) 11. Gasket, for test jar (5 pcs) 12. Thermometer Holder, for test jar (1 pc) **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

30.	**Smoke Point: ASTM D1322** **Technical Specification:** 1. This test method covers a procedure for determination of the Smoke Point of Kerosine and Aviation turbine fuel 2. Test Method: ASTM D1322 3. Brass lamp painted in black 4. Millimetric white scale on a black background 5. Window with mobile glass 6. Brass candle with oil tank and cotton wick 180 mm long 7. Micrometric setting **Accessories :** 1. K27021 Extracted Cotton Wicks Prepared in accordance with ASTM D1322 (9.2) requirements. 2. Packed in a sealed tube with desiccant. 3. Case of 12 K27020 Cotton Wicks, pack of 12 K27050 Sighting Device 1 Installs on chimney of Smoke Point Lamp. 4. Eliminates parallax K27060 Wick Insertion Tool 1 Facilitates insertion of cotton wick into wick tube K27065 Wick Trimmer 1 Use together with K27060 Insertion Tool to place wick at the correct height in the wick tube, free of twists and frayed ends. 5. K27010 Interchangeable Candle **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

31.	**Automatic Aniline Point: ASTM D611** **Technical Specification:** 1. Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents. Test method E describes a procedure using an automatic apparatus suitable for the range covered by test method. 2. Test Method: ASTM D611 3. Automatic unit able to measure products with ASTM color less than 8 4. The sample-aniline mixture is directly heated by a platinum immersion heater and the aniline point is detected photoelectrically. 5. Point determinations automatically by means of a modified thin film technique (ASTM D611 Method E). 6. Removable glass cell for cleaning 7. Aniline points as low as 0°C (32°F) can be determined with the use of refrigerated cooling air 8. Wide 8" touch panel pc is installed with dedicated managing software Aniline programs as for standard heating and cooling profile and costums procedure available. 9. Temperature probe fiber optic and mirror are inside the sample and not outside the glassware. 10. Automatic stirrer made of brass, 3 coils 11. Solid structure painted with epoxy anti-acid products 12. Equipped with variable controls for heater, light source and stirrer speed. 13. Double detection system able to detect dark and clear samples 14. Managed by a touch screen panel PC · TFT/LCD 8” · 40 Gb HD · resolution 1024 × 768 and 16 M colours · 2 × USB Ports for connecting pen drive and printer 15. The dedicated software manages: · the bath temperatures by means of a PT100 sensor class A that can be displayed in °C / °F, including the over temperature safety alarm 16. Dedicated software for real time monitoring and recording that includes: · graph creation in real time during the test · invalid test indication · export of files in xls / pdf / jpg format · calibration up to 100 points 17. Power Supply: 220V, 50Hz **Included Accessories** 1. Standard Borosilicate Glass Test Cell with drain **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

32.	**Freezing Point: ASTM D2386** **Technical specification:** 1. Covers the determination of the temperature below which solid hydrocarbon crystals may form in aviation turbine fuels and aviation gasoline 2. Double tube 30 × 240 mm fitted with cap with a stopper supporting the thermometer and moisture-proof collar through which the stirrer passes 3. Dewar jar 75 × 280 mm mount-based 4. Stirrer made of 1.6 mm brass rod bent into a smooth three-loop spiral at the bottom 5. Jacketed Sample Tube: A double-walled, Silvered vessel with a stopper supporting the thermometer and moisture-proof collar through which the stirrer passes. 6. Un-Silvered vacuum flask, for the immersion of the jacketed sample tube, supplied with its housing base 7. Electrical Stirrer made of 1.6-mm brass rod bent into a smooth three-loop spiral at the bottom 8. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

33.	**Automatic Freezing Points Apparatus for Aviation Fuels: ASTM D5972** **Technical Specification:** 1. The equipment should have rugged construction with Built in software for reporting the collected Freezing Point data into desired report format with units. 2. Freeze point should be measured automatically according to ASTMD-5972 method and shall comply all the specifications as per the method. 3. Must have facility to add cloud point based on ASTM D5773 in future. 4. System should have rapid cooling / Heating in built system operating under the principle of Peltier effect to avoid any additional external chiller or cooling unit. 5. Temperature measurement must be using highly precise devices with test resolution of 0.1 ºC 6. The derived results of Freezing Point should be closely in comparison with ASTM D2386 respectively. 7. Repeatability and reproducibility of the instrument must be as per respective test methods. 8. System shall be able to attain sample temperature range −88°C to 70°C. 9. Test must be completed within 15 minutes. 10. Sample volume required for a test must not be more than 0.15ml per test. 11. Instrument must have built in Full-color, touch-sensitive, 15" high resolution LCD touch screen 12. Provision for alert sounds / Alarm when test is finished and ready for next run. 13. Customizable reporting – test history, plot data and self-diagnostics to be displayed on-screen, printed or transferred to computer 14. **Methods; ASTM D5972**, ASTM D1655 & DEFSTAN 91-91 15. The equipment shall have memory to store atleast 500 test results along with plots. 16. Instrument must be supplied with Freezing point reference material. Qty : 25ml 17. Power Supply: 220V, 50Hz **Consumables to be included:** 1. Pipette tips for 2000 tests 2. Dryer desiccant : 10 pack 3. Cotton Swabs for 2000 tests 4. Sample dryer sacs for removing moisture in Jet fuel sample : 1000 sacs **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

34.	**Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter: ASTM D4809/ASTM D3338.** **Technical Specification:** 1. Test method: ASTM D4809/ASTM D3338 2. **Isoperibol Jacket System** Outstanding thermal jacketing is provided by a circulating water system driven by a built-in, high capacity pump which maintains a continuous forced flow around the sides and bottom of the bucket chamber and through the cover as well. A sealed immersion heater and a built-in heat exchanger, both operated by the calorimeter controller, provide precise jacket temperature control. 3. **Automatic Oxygen Fill** To speed and simplify the bomb filling operation, the Calorimeter has an automatic system for charging the bomb with oxygen. Oxygen is connected to a microprocessor controlled solenoid installed in the calorimeter. **The Expanded System includes** the following components: a. Calorimeter b. Water Handling System c. Printer d. Extra Bomb and Bucket e. Bomb Maintenance Kit f. 1 Year Service Kit 4. Tests Per Hour: 4 – 7 5. Operator Time Per Test: 6 Minutes 6. Precision Classification: 0.05 - 0.1% Class 7. Jacket Type: Isoperibol, Water Jacket 8. Oxygen Fill: Automatic 9. Bucket Fill: Manual 10. Bomb Wash: Manual 11. Balance Communication: USB 12. Printer Communication: USB 13. Network Connection: TCP/IP via Ethernet 14. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**
35.	**Thermal Stability - Jet Fuel Thermal Oxidation Test (JFTOT): ASTM D3241**	**1 Set**

Technical Specification:

- **Creating a safe environment in the lab Improved built-in safety:**

a) Decreasing operator exposure to jet fuel vapor with a vapor containment system
b) Preventing exposure to the hot heater tube section with a safety door; test won't start until the door is closed
c) Reducing exposure to fuel by flushing it at the end of the test; keeps test section dry during disassembly

- **High levels of automation and hardware advancements**

a) Automating traditionally time-intensive manual activities, such as pump priming, flow monitoring, and sample aeration
b) Enhanced user functionalities easy and fast data extraction with the new fully integrated RFID reader/ writer for the Intelligent Heater Tubes™ (IHT)
c) Instrument software supports multiple languages

- **Reduced user intervention**

a) JFTOT with advanced technology improvements:
b) Contribute to a significantly faster analysis cycle time
c) Reduces operator intervention by ~40 minutes
d) Allows the operator to focus on higher value responsibilities.
e) Provides traceable results with the IHT by by storing the analysis data electronically on the IHT, rather than only having a hard copy print out of the test

- Sample Capacity: 600 mL or more
- Test Method: ASTM D3241
- Test Temperature: 100°C – 380°C
- Differential Pressure Range: 0 – 280 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 (Chromel/Alumel)-K-Type**,** 0 ^{0}C to 500
- Thermocouple Temperature: Range 0°C to +500°C
- Test Time Range Programmable: 4 to 600 minutes
- Calibration: Should have Auto-Calibration facility.
- Printing: External/ Internal
- Fuel Aeration Timer: 6 min. with a flow rate of 1.5 L/min.
- Coolant Flow Rate: 39 L/hrs.(approx.)
- Aeration Flow Rate: 1.5 L/min
- Coolant Flow Rate: 38 L/hr (10 Gal/hr)
- Ambient Operating Temperature Range: +10°C to +35°C (D3241 test limited to +15°C to +32°C)
- Maximum Operating Current : A/3.5A

	• Relative Humidity 20% to 90% non-condensing • Display: Digital Display with Touch Screen/keyboard 15. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	

36.	**Water Reaction of Aviation Fuels: ASTM D1094** **Technical Specification:** 1. This test method covers the determination of the presence of water miscible components in aviation gasoline and turbine fuels, and the effect of these components on volume change and on the fuel-water. 2. This test method covers the determination of the presence of water miscible components in aviation gasoline and turbine fuels, and the effect of these components on volume change and on the fuel-water. 3. 4 × Cylinders in glass from 100 ml div.1 ml 4. with glass cap 5. Shaker to vertical movement with a timer 0-99 minutes/seconds 6. Fixing table for accommodate up to 4 cylinders 7. Methods: ASTM D1094; DIN 12685 (obs.) & ISO 4788 8. Power Supply: 220V, 50Hz, 300W **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

37.	**Water Separation Characteristics of Aviation Turbine Fuels by Portable Separometer (Micro-Separometer rating): ASTM D3948** **Technical Specification:** 1. Micro-Separometer is a electro-mechanical instrument used to perform four discrete tests. ASTM Standard Test Methods D3948 (Jet), D7224 (Jet) andD7261 (Diesel) are used to rate water separation characteristic sand D4860 (Jet or Diesel) detects and numerically rates free water and particulate contamination. Note- This instrument performs each of the four tests above simply by using one of the four "Six Packs" containing the proper coalescer cells. 2. Test Method D3948, D7224 and D7261 employs the use of a turbidimeter,a mechanical mixer, anda disposable coalescer filter. A portion of the sample, in a clear glass vial, is used to set the meter to read 100. 3. The sample in the vial is discarded and the vial is retained. Another portion of the sample in a plastic syringe is used to create a water/fuel emulsion using the mixer .The emulsion is passed through the filter at a programmed rate and a portion is collected in the retained vial. 4. The vial is replaced in the turbidimeter and the water separation characteristic of the fuel is rated. The value obtained is compared to the unprocessed sample that was used to set the meter to 100. The higher the rating, 100 being the maximum, the less surfactant present 5. A box commonly known as a "Six Pack" that contains six test kits is shown above. 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. 6. Test Method D4860 passesa portion of the sample through a filter medium, which is collected in a clear glass, vial. The vial is placed in the turbidimeter and the meter is adjusted to 100. The processed fuel is discarded and a portion of the unprocessed fuel is placed in the vial, which is re-inserted in the turbidimeter. Higher ratings, 100 is maximum, indicate that there is less free water and particulate present. 7. Methods: ASTM D3948, D7224, D7261& D4860 8. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

38.	**Electrical Conductivity of Jet Fuels: ASTM D2624/IP274** **Technical Specification:** 1. The unit is provided in an industry standard polyamide housing, with built in Lithium Ion rechargeable battery system. The conductivity sensor is constructed of two 316SS coaxial electrode sensors. It has an easy to use menu system allowing up to 10 samples to be internally stored along with Sample Temperature, Date and Time. 2. Higher Accuracy AC Measurement. 3. Conductivity and temperature output capability. 4. High-Accuracy (± 2% of reading) 5. Stores up to 10 Data Locations (User can input Location Names) 6. USB interface for ease of data transfer to user. 7. Fully Temperature Compensated Measurement 8. Built-in Long Life Lithium-Ion Rechargeable Battery. 9. Windows Data Handling Software. 10. Internal Real Time Date & Clock for Data Record Keeping. 11. Conductivity Range: 0-2000 pS/m (optional ranges available – contact factory) 12. Conductivity Accuracy: ± 2 pS/m (± 2% of reading) 13. Conductivity Resolution: 0.1 pS/m 14. Temperature Range: 0-35°C (optional ranges available – contact factory) 15. Temperature Accuracy: ± 0.5°C 16. Temperature Resolution: 0.1°C 17. Power: Built-in 2.6AHr Lithium Ion Battery (1000 samples) 18. Outputs: 128x64 Dot Matrix Display Indicating Conductivity and Temperature; Sample Trend Line Graph to Assist Data Collection 19. Conductivity Sensor: 316 SS Coaxial Electrode 20. Temperature Sensor: Platinum RTD NIST Traceable Calibration 21. Materials: Housing Polyamide; Sensor 316SS and PEEK 22. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

39.	**Emulsification Test: ASTM D1401** **Technical Specification:** 1. The Emulsifier is a compact and efficient benchtop instrument designed to measure the ability of petroleum oils and synthetic fluids to separate from water. 2. The instrument incorporates 4 test stirrers, with independent control and motorised raising and lowering. Samples can be tested simultaneously or individually to suit laboratory requirements. 3. Test cylinders are located in a temperature controlled bath with an adjustable set point of either 54 or 82 °C, in accordance with ASTM and ISO test methods. A large LCD touch screen display is used to initiate test and provides automated sequencing with an audible and visual reminder at each recording interval 4. Each stirrer is held by a self centering collets to ensure concentricity within 1mm and can remain in situ when removing or replacing cylinders. Positioning within 6mm from the bottom of the cylinder is automatically achieved using a motorised actuator. After the stirring period the motorised head raises the stirrer until clear of the graduate cylinder to allow for wiping and on completion of the test, the stirrer will revert to the higher, home position. 5. Test cylinders are located in a temperature controlled bath with an adjustable set point of either 54 or 82°C. A large viewing window and non-reflective LED lighting assists operator reading. The bath top plate is designed to allow cylinders to tilt for easy removal. A drain valve is provided for service and maintenance. 6. A large colour touch screen display is used to initiate tests and provides automated sequencing with an audible and visual reminder at each recording interval. Custom test parameters are also user adjustable 7. Fully automated paddle movement with motorised raising and lowering 8. Movable digital stirrer with microprocessor control incorporates advanced features for flexibility and ease of operation 9. Clear, illuminated heating bath provides excellent visibility 10. Microprocessor temperature control with digital display and built in protection against over-temperature and low liquid level hazards 11. Easy sample handling without removing the stirrer paddle 12. Self-centering collet to ensure concentricity within 1mm 13. Positioning within 6mm from the bottom of the cylinder automatically achieved Large LCD touch screen display 14. Integrated timer with audible and visual reminders for recording intervals **1. Operator Safety** • Obstruction override if paddles are placed under any resistant load • Duplex protective viewing glass • Automatic high temperature cut out	**1 Set**

	• Overflow prevention • Automatic low-level liquid trip • Abort button for emergency all stop **2. Precision and Accuracy** • Non-reflective enhanced LED lighting for improved measurement precision • User adjustable sample temperature stabilisation time • Post stirring, intermediate scraping position ensures accurate readings • Guaranteed paddle rotation speed, regardless of viscosity • Large viewing window **3. Enhanced Test Throughput** • 4 independent test stations reduce waiting time • Rapid bath heat up time • Test Method: ASTM D1401; ISO 6614; FTM 791-3201; IP 412 • Bath volume: 5 litres • Bath liquid: Water or White oil • Sample size: 40 ml oil; 40 ml; distilled water 1% sodium chloride solution or; synthetic seawater • Test temperatures: 54 ^{0}C and 82^{0}C • Bath temperature stability: ±1 ^{0}C • Stirrer speed: 1500 ± 15 rpm 4. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	

40.	**Ash content: ASTM D482** **Technical Specification:** 1. This test method covers the determination of ash in the range 0.001- 0.180 mass %, from distillate and residual fuels, gas turbine fuels, crude oils, lubricating oils, waxes, and other petroleum products, in which any ash-forming materials present are normally considered to be undesirable impurities or contaminants. 2. Test Methods: ASTM D482, ASTM D874 3. The test method is limited to petroleum products which are free from added ash-forming additives, including certain phosphorus compounds. 4. Insulation heat made in ceramics fibre in order to get a speed heating with a limited	**1 Set**

	energetic consumption 5. Heating muffle unthreaded from the back, in an only cast of refractory cordieletic material to provide for thermal jolts 6. Natural draught posterior exhaust of the smokes 7. Control panel is positioned on the furnace bottom containing a digital visualized thermo-regulator and safety switch for system protection 8. Temperature Range: Ambient - 1100°C Temperature Accuracy: ± 3°C 9. 6 complete air exchanges per minute 10. Touch Screen Control Panel 11. Evaporation Crucible, Porcelain, 30mL, ----------Qty-pk/6 12. Power Supply: 220V, 50Hz , 3.9kW **Country of Origin: UK/EU/USA/Japan/China/India.**	
41.	**Sediment in Crude and Fuel Oils: ASTM D473** **Technical Specification:** 1. Covers the determination of sediment in crude oils and fuel oils by extraction with toluene. 2. Test Methods: ASTM D473 DIN 51789 IP 53 ISO 3735 3. The precision applies to a range of sediment levels from 0.01 to 0.40 % mass, although higher levels may be determined. 4. 1000 ml Erlenmeyer flask 5. Stainless steel basket supporting an extraction thimble of alundum 6. Cooling metal coil 7. Water cup 8. Heating device unit 600 W 9. Power Supply: 220V, 50Hz **Sediment Extraction Apparatus included** : - 1000ml Flask - Stainless Steel Condenser - Wire Basket - Water Cup - Extraction Thimble **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

42.	**Carbon Residue: ASTM D189** **Technical Specification:** 1. This test method covers the determination of the amount of carbon residue left after evaporation and pyrolysis of an oil, and is intended to provide some indication of relative coke-forming propensities. 2. LPG-heated by Meker lamp fitted with safety valve 3. Metal tripod holder with Nichrome triangle 4. External insulating ring block fining painted 5. Metallic chimney with handle • Crucibles: porcelain crucible, inner iron crucible, outer iron crucible 6. Test Methods: ASTM D189, ASTM D2416 7. Covers: inner skidmore cover, outer iron cover 8. User manual and power cable making part of scope of supply 9. Power Supply: 220V, 50Hz **Included Accessories:** 1. Porcelain crucible.2. 2. Skidmore crucible, with monel cover.3. 3. Monel crucible, with cover. 4. Monel hood, with bridge. 5. Refractory block. 6. ASTM 8F Thermometer range: 30 to 404°C recommended for testing light distillate oils. 7. ASTM 8C Thermometer Range: -2 to 400°C. **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

43.	**LPG sample bottle: ASTM D1265** **Technical Specification:** **1.** A heavy duty stainless steel double Valve Sampling Cylinder suitable for drawing LPG samples from pressurized storage and transferring them to laboratory equipment. 2. Test Method: ASTM D1265 3. Capacity: 150ml,300ml,500ml,1000ml,2500ml,3000ml. 4. Welded stainless steel cylinders for obtaining representative samples of liquefied petroleum (LP) gases. 5. Two-valve type (1/4 IPS), with 20% outage tube and built-in pressure relief valve factory preset between 540 to 600psi (38-42 kg/cm2). 6. 46 bar (670 psi) maximum working pressure 7. Right angled valves 8. 20% outage tube 9. 1316 stainless steel body and valve 10. 1/8in. BSP accessory connections 11. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

44.	**Water Content: ASTM D95** **Technical Specification:** 1. This test method covers the determination of water in the range from 0 to 25 % volume in petroleum products, tars, and other bituminous materials by the distillation method. 2. Test Methods: ASTM D95, ASTM D4006 3. Metallic case structure painted with anti-acid products equipped 4. Heating mantle 300 Watt with steel rod and clamp 5. Consists of glass still, 400mm condenser, 10mL receiver and 1000mL flask. Includes 750W heating mantle with control, 500-1000ml capacity. 6. Main switch and heating regulator. 7. 500 ml round bottom flask and Liebig Condenser made in glass. 8. Included Graduated 5 ml,10ml & 25ml receivers. 9. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

45.	**pH Meter:** **Technical Specification:** 1. Portable two-channel pH measuring instrument for measuring pH/mV and temperature. You will be optimally equipped for measurements in the field with this battery-operated measuring instrument. Portable pH meter with built-in battery pack and two galvanically isolated pH measuring inputs. 2. Digital pH measuring input for the intelligent pH electrodes. 3. Robust, water-tight and dust-tight housing (IP67) for hard outdoor and laboratory use. 4. LCD color display with background illumination for simple legibility of the results. 5. USB interface for simple data export to PC or printer. 6. Large internal memory (10,000 data sets). 7. Pin-protected User and Expert modes, prevents unwanted parameter changes. 8. GLP-compliant printout and data export with User ID and timestamp. 9. Display: 3.5" color display 10. Good Laboratory Practice (GLP): Yes, data with User ID, timestamp, electrode ID 11. Measuring inputs:2 12. Measuring mode: 1 x pH/U/T analog; 1 x pH/U/T digital 13. Memory size: 10,000 measured values, in non-volatile memory 14. mV accuracy: ±0.2 mV 15. mV range: -1,200.0 mV - +1,200.0 mV 16. mV resolution: 0.1 mV 17. pH accuracy: ±0.003 pH 18. pH calibration points: 1 - 5 19. pH range:-13,000 - +20,000 20. pH resolution:0.001 pH 21. Power supply: Lithium-polymer rechargeable battery 3.7 V; 3,000 mAh 22. Protection class: IP67 23. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

46.	**Conductivity /TDS Meter:** **Technical Specification:** 1. Two-channel pH / conductivity measuring instrument for measuring pH/mV / conductivity / TDS / salinity and temperature. You will be optimally equipped for measurements in the field with this battery-operated measuring instrument. Portable pH measuring instrument with built-in battery pack. 2. Parallel measurement of pH value and conductivity. 3. Analog pH measuring input for standard pH electrodes. 4. Analog conductivity measuring input for the 4-wire conductivity measuring cells. 5. Robust, water-tight and dust-tight housing (IP67) for hard outdoor and laboratory use. 6. LCD color display with background illumination for simple legibility of the results. 7. USB interface for simple data export to PC or printer. 8. Large internal memory (10,000 data sets). 9. Conductance accuracy: ±0.5% at 0.1 µS - 16 µS ; ±0.5% at 16 µS - 1 mS ; & ±1.0% at 1 mS - 500 mS 10. Conductance range: 0.1 µS - 500 mS 11. Conductance resolution: 4 significant digits 12. Display: 3.5" color display 13. Good Laboratory Practice (GLP): Yes, data with User ID, timestamp, electrode ID 14. Measuring inputs: 2 15. Measuring mode: 1 x conductivity/TDS/salinity/T analog; 1 x pH/U/T analog 16. Memory size: 10,000 measured values 17. mV accuracy: ±0.2 mV 18. mV range: -1,200.0 mV - +1,200.0 mV 19. mV resolution: 0.1 mV 20. pH accuracy: ±0.003 pH 21. pH calibration points: 1 - 5 22. pH range: -13,000 - +20,000 23. pH resolution: 0.001 pH 24. Power supply: Lithium-polymer rechargeable battery 3.7 V; 3,000 mAh 25. Protection class: IP67 26. Included Conductivity standards: 1000 µS/cm; 2000 µS/cm & 5000 µS/cm. 27. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

47.	**Drying oven:** **Technical Specification:** 1. A digitally controlled oven suitable for heat storage, heat treatment and drying processes at temperatures up to 300 °C for timed periods up to 999 hours. 2. The laboratory oven comprises a control panel with an integral high definition TFT-colour display, a 53 litre capacity, heated working chamber, a Pt100 temperature sensor, an ethernet interface, and an over-temperature protection system. 3. The internal working space is manufactured from corrosion resisting steel and has a moveable perforated stainless steel shelf 4. Temp range ambient +5 to 300 °C 5. 1 minute to 99 days timer 6. Natural convection 7. Chamber ventilation slide adjustment 8. Calibrated 8. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

48.	**Precision Balance:** • Electronics Analytical Balance • Automatic zero • Selectable units • Glass windshield with 3 access doors • Power supply: 220 V, 50Hz 1. Readability: 0.01mg: 1 unit; 120gm 2. Readability: 0.1 mg: 1 unit; 210gm 3. Readability: 1.0 gm: 1 unit; 210gm	**1 Set**

49.	**UV-VIS Spectrophotomer:** **Technical Specification:** **1.** The test parameters in water are Phosphate, Iron, Zinc, Silica, Turbidity **2.** New reference beam : more accurate, less drift **3.** New acquisition system : 2 times faster **4.** New large color screen : better ergonomy **5.** New special mode : calculation according mathematical formulation and integration of additional variables **6.** Lamps lifetime improved : up to 4 years on Uviline 9300 and whole lifetime product **7.** Guaranteed straylight < 1% **8.** Wavelength range: 190-1100nm **9.** Light source: Xenon **10.** Spectral bandwidth: 4 nm **11.** Incremental WL step: Reading: 0.1 nm & Setting: 1 nm **12.** Wavelength accuracy: ± 1 nm **13.** Wavelength repeatability: ± 0.5 nm **14.** Absorbance range: ± 3,500 Abs **15.** Absorbance resolution: 0,001 Abs ou 0,1% T **16.** Photometric accuracy: ± 0,003 Abs (0,5 Abs) ± 0,005 Abs (1,0 Abs) ± 0,010 Abs (2,0 Abs) 17. Stray light: 1 %T at 198nm (KCl) < 0,1 %T at 220nm (NaI) < 0,05 %T at 340 nm (GG375) < 0,05 %T at 408 nm (GG408) 18. Flatness baseline: ± 0,002 Abs 19. Scanning speed: Low – medium – fast > 800 nm/min 20. Interface: 1 USB-A, 1 USB-B, Ethernet RJ45 21. IP: IP 30 with drain in the cell compartment 22. Temperature (°C): Use: 10°C to 35°C 23. Included 1000ppm standards for each Phosphate, Iron, Zinc, Silica, and Turbidity tests 24. Power Supply: 220V, 50Hz	**1 Set**

	Country of Origin: UK/EU/USA/Japan/China/India.	

50.	**Schilling Effusiometer: IP59** **Technical Specification:** 1. The methods described are for the determination of the density or relative density of petroleum products as normally handled. 2. Test Method: IP59 3. Glass cylinder 4. Cylinder cover fitted with three sphere valves for gas charge and flow-off 5. Stainless steel orifice plate with a gauged Ø 0.45 mm 6. Internal tube fitted with two calibration weight lines 7. Thermometer IP 39C **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

51.	**Particulate Contamination in Aviation Fuels by Filtration: ASTM D5452.** **Technical Specification:** 1. Metallic filter funnel supported by a base with support for closing of the tightness membrane 2. 100 pcs. of 0.8 micron membrane filters Ø 47 mm made of cellulose acetate 3. 5 litres filling container made in stainless steel with stopper for spillage 4. Two receiver and security 5 litres cylindrical bottles for vacuum 5. Connection bottle to bottle by vacuum tube 6. Bottles provided with grounding system 7. Metallic structure for apparatus assembling 8. Rubber stoppers and tubes for connection 9. Filter forceps, 25mm solvent filtering dispenser, vacuum filtering flask, 10. Petri dishes and earth bonding/grounding as specified in the method. 11. Sample container should be 3.8 to 5-ltr epoxy lined sample can. **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

52.	**Water Content: ASTM D6304** **Technical Specification:** **1.** Test Method: ASTM D6304 2. Despite their compact design the Coulometers leave no wishes unfulfilled. The printer is already built in Coulometer, and the two RS-232 interfaces allow communication with a balance, external printer and/or computer. 3. Change of KF solution at the touch of a button: If a 700 Dosino is connected to the Coulometer, the spent solution can be replaced at the touch of a button. 4. Flexible but easy to operate: The instruments have a standard and an expert mode. In the standard mode only those functions are accessible that are needed in routine work. 5. Cell with or without diaphragm: Both Coulometers are available with two different types of generator cells. 6. Method memory: The integrated method memory has space for about 100 methods. 7. Thermal sample preparation with KF oven: The instruments can be operated together with a KF oven. 8. Stand-alone or software-controlled: You decide whether the instrument is controlled via the incorporated keypad or by means of a computer and tiamo TM software. 9. This sample preparation is easy and consists in weighing the sample into a vial and then sealing the vial so it is air tight. The sample is then heated in the oven; the water in the sample is evaporated and transported by a stream of dry carrier gas into the titration cell. 10. Using thermal sample preparation, there is no need for harmful solvents. Moreover, secondary reactions, matrix effects and contamination of the titration cell are completely avoided. Finally, the Karl Fischer reagent needs to be replaced less frequently. 11. Alternatively, the Coulometer can be controlled with tiamo software. The Coulometer is connected to a computer by way of one of the RS-232 interfaces. In this way you have all the features and advantages of tiamo available to you. 12. Water contents: 10 µg - 200 mg 13. Sample types: solid, liquid, gaseous 14. Number of predefined methods: 4 15. Number of methods that can be stored: up to 100 16. Automation: Oven Sample Processor 17. Automatic conditioning: yes 18. Live curve: yes 19. Recalculation of results: yes 20. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

53.	**Automatic Lubricity test of Aviation fuels by BOCLE: ASTM D5001** **Technical Specification:** 1. Test method: ASTM D5001 2. Fluid Volume: 50±1 ml 3. Fuel conditioning time: 15 minutes, ±1 second max 4. Test duration: 30 minutes, ±1 second max 5. Ambient temperature limits: +5.0 to +35.0°C 6. Fuel temperature control: 25.0 ±0.5 max, ±0.1°C typical. 7. Conditioned air control: Flow rate 3.8 ±0.05 litres/min RH 10.0 ±0.1% indicated Temperature 25.0 ±0.5 max, ±0.1°C typical 8. Motor speed: 240.0 ±0.5 rpm 9. Applied load: 1000g (500g weight) 10. Power Supply: 220V, 50Hz **Country of Origin: UK/EU/USA/Japan/China/India.**	**1 Set**

54.	**ASTM D86 Synthetic Distillation Standard** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
55.	**ASTM D93 Flash Point by Pensky-Martens Closed Cup** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
56.	**ASTM D97 Pour Point** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
57.	**ASTM D323 Reid Vapor Pressure of Petroleum Products** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
58.	**ASTM D445 Kinematic Viscosity** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
59.	**ASTM D1322 Smoke Point** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
60.	**ASTM D611 Aniline Point** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel

61.	**ASTM D2386 Freezing Point** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
62.	**ASTM D4052 Density, Relative, and API Gravity of Liquids** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
63.	**ASTM D664 TAN** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
64.	**ASTM D2896 TBN** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
65.	**ASTM D1500 ASTM Color (2.5 ASTM color & 3.5 ASTM color)** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel
66.	**ASTM D156 Saybolt color (+10 & +21)** Certified in accordance to ISO 17025 **Country of Origin: UK/EU/USA/INDIA**	1 bottel