

<b>Details of equipments</b>			
<b>S. No.</b>	<b>Name of Equipment</b>	<b>Specifications</b>	<b>Remark</b>
1.	Analytical Balance	Weighing capacity of 60 grams or more and increments in 0.0001 grams graduations (4 decimal places). Repeatability : $\pm 0.1$ mg Response time : 3.0 seconds or better Tare range: full to capacity Weight units: mg, g, kg, lb	<b>Quotation invitation –</b> 03.12.2015 <b>Quotation Submission -</b> 18.12.2015, 14:00hrs  <b>Quotation Opening –</b> 18.12.2015, 15:00 hrs
2.	FT-IR	Spectral Range 500 to 7,500 $\text{cm}^{-1}$ , Resolution better than 0.8 $\text{cm}^{-1}$ , Signal to Noise (60 s, 4 $\text{cm}^{-1}$ , at peak response) 50,000: 1, Signal Sampling 24-bit ADC, Short-term Stability < 0.09 %, Temperature Stability < 1 % per degree Celsius, Wave Number Repeatability (@ 1918 $\text{cm}^{-1}$ ). Beamsplitter Material ZnSe optics (non-hygroscopic) interferometer and Gold Coated optics for maximum light throughput. interferometer bearing mechanism must be wear-free (frictionless) design to ensure unlimited lifetime. The interferometer must utilize retro reflecting cube corners for instantaneous correction of instability through mirror tilt. fully jacketed, Purgeable Enclosure, detector head & sample compartment Source (with electronic stabilization)(Ceramic Globar) ,Solid-state Laser, Detector Module DTGS Hardware Port Ethernet, 10/100 Mbps Connection Direct-connect or LAN, Certify latest Library for all food applications with software The software must have quantification tool with graphical macro editor for quantitative analysis. ATR sampling kit to analyze solids, liquids, pastes, gels and intractable materials Supply and installation of One Branded Window AC of capacity 2 Ton with stabilizer and required wiring and MCB is mandatory along with supply of instrument which is required to improve the efficiency and maintain non- humid environment necessary for safety of the	<b>Quotation invitation –</b> 03.12.2015 <b>Quotation Submission -</b> 18.12.2015, 14:00hrs  <b>Quotation Opening –</b> 18.12.2015, 15:00 hrs

		instrument. Personal Computer (PC): Branded with 8GB RAM, I-7 Processor, DVD Writer, 1 TB or higher HDD, 19" TFT Color Monitor, Color Laser Printer along with 5 KVA servo control voltage stabilizer	
3.	Multi Fuel Analyzer	<p>Measurement Principle : FTIR and NIR based, fully automated, portable standalone</p> <p>Measurement Cell type : Double Cell and Double Interferometer</p> <p>Operating range : 550-7000 cm-1 (12.900 Data Points)</p> <p>Spectral resolution : <math>\leq 2\text{cm}^{-1}</math></p> <p>Sample introduction : Automatic</p> <p>Rinsing Cycle : Automatic &amp; Selectable</p> <p>Measurement : In both percentages of volume &amp; weight modes</p> <p>Density Measurement range : 0 - 3 gm/cc.</p> <p>Density Meter Type : Built-In Temperature Controlled Oscillating U-Tube Cell</p> <p>Warm up /scanning time : 1min/80 s multiple scans</p> <p>Scanning type : Laser controlled (Optimized scanning technology)</p> <p>Chemometrics : Advanced Chemometrics, including K-Matrix, MLR and PLS</p> <p>Memory : &gt;700 data results, all results spectra saved automatically</p> <p>Operating Temperature : 5 to 50°C</p> <p>The equipment should measure the following:</p> <ul style="list-style-type: none"> <li>• Oxygenates as per ASTM D5845</li> <li>• Aromatics, PNA and Benzene as per ASTM D6277</li> <li>• Biodiesel Content (FAME) as per EN 14078</li> <li>• Octane boosters and Cetane Improvers</li> </ul>	<p><b>Quotation invitation –</b> 03.12.2015</p> <p><b>Quotation Submission -</b> 18.12.2015, 14:00hrs</p> <p><b>Quotation Opening –</b> 18.12.2015, 15:00 hrs</p>

		<ul style="list-style-type: none"> <li>• Total parameters: Aromatics, Olefins, Oxygen and Saturates</li> <li>• Predicted Octane Numbers: RON, MON, AKI</li> <li>• Predicted Cetane Number, Cetane Index</li> <li>• Predicted Distillation properties: IBP, T10, T50, T65, T85, T90, T95, FBP, E200, E300, R250, R350</li> <li>• RVP (Reid Vapor Pressure), DVPE, VOC prediction</li> </ul>	
4	Rheometer	<p><b>MOTOR TECHNOLOGY:</b>  SYNCHRONOUS MOTOR /BRUSHLESS DC MOTOR /DYNAMIC MOTOR</p> <p><b>TORQUE RANGE:</b>  10 nNm to 200mNm OR BETTER</p> <p><b>TORQUE RESOLUTION:</b>  BETTER THAN or EQUAL to 0.5nNm</p> <p><b>MOTOR BEARING:</b>  DUAL AIR BEARING – RADIAL &amp; AXIAL</p> <p><b>SPEED RANGE:</b>  10E-7 to 314 rad/s OR BETTER</p> <p><b>FREQUENCY RANGE:</b>  10E-6 to 628 rad/s OR BETTER</p> <p><b>ANGULAR(STRAIN) RESOLUTION:</b>  10nrad OR BETTER</p> <p><b>STRAIN SENSOR:</b>  HIGH RESOLUTION OPTICAL ENCODER</p> <p><b>MEASUREMENT TYPES:</b>  ROTATIONAL , OSCILLATORY &amp; TRANSIENT</p> <p><b>OSCILLATORY MODES:</b>  STRAIN, DIRECT STRAIN AMPLITUDE &amp; CONTROL STRESS</p> <p><b>NORMAL FORCE :</b>  0.01 to 50N</p> <p><b>NORMAL FORCE RESOLUTION:</b>  0.001N</p> <p><b>GAP CONTROL :</b></p>	<p><b>Quotation invitation –</b>  03.12.2015</p> <p><b>Quotation Submission -</b>  18.12.2015, 14:00hrs</p> <p><b>Quotation Opening –</b>  18.12.2015, 15:00 hrs</p>

AUTOMATIC GAP CONTROL  
 MEASURING SYSTEM CONNECTION:  
 SCREWLESS QUICK FITTING  
**TEMPERATURE CONTROL SYSTEM WITH SOLVENT TRAP**  
 TEMPERATURE CONTROL:  
 ELECTRICAL TEMPERATURE CONTROL  
 TEMPERATURE RANGE:  
 0 TO 400 DEG C  
**MEASURING SYSTEMS**  
 SHEAR VISCOMETRY/RHEOLOGY:  
 MEASURING PLATE DIAMETER 50 MM -01 NO.  
 MEASURING PLATE DIAMETER 25MM -01 NO.  
 CONE WITH 50 MM DIA & 1 DEG ANGLE-01 NO.  
**DIGITAL MICROSCOPE ATTACHMENT FOR STRUCTURAL ANALYSIS (OPTIONAL)**  
 TEMPERATURE RANGE :  
 -20 TO 200 DEGC THROUGH PELTIER TEMPERATUE CONTROL  
 USB DIGITAL CAMEA MAGNIFICATION:  
 50X AND ABOVE  
 MEASURING GEOMETRIES:  
 PLATE/PLATE  
**UTILITIES**  
 AIR COMPRESSOR:  
 100PSI, 5CFM OILFREE SYSTEM  
 AIR DRYER:  
 MULTISTAGE MEMBRANE TYPE WITH MICROFILTERS  
**RHEOLOGY SOFTWARE**  
 ARCHITECHTURE: TEMPLATE BASED WITH ATLEAST 60 BUILT-IN TEMPLATES PRE-PROGRAMMED FOR ALL TYPES OF MATERIALS

		<p>ANALYSIS MODULES:  INTEGRATED MODELLING/CURVE FITTING, RHEO-OPTICS  ADAPTER MODULE, SQUEEZE FLOW RHEOLOGY AND  EXTENSIONAL RHEOLOGY MODULES.</p> <p>TESTING PROTOCOLS:  ROTATIONAL WITH TRURATE/CONTROL  STRESS/COMBINATION OF CSR+CSS,  OSCILLATORY WITH TRU STRAIN / DIRECT STRAIN  AMPLITUDE / CONTROL STRESS / COMBINATION OF  TRUSTRAIN+CSS  TRANSIENT WITH CREEP(SINGLE/MULTI-LEVEL)/STEP-  STRAIN(STRESS RELAXATION)  COMBINATION WITH ANY MODES ABOVE – FOR E.G.  TRANSIENT+ROTATIONAL OR OSCILLATORY+ROTATIONAL  SUPER-IMPOSED TESTING:  STEADY SHEAR OVER OSCILLATORY SIMULTANEOUS  OPERATION</p>	
5	Glossmeter	<p>20° 60° 85° gloss with inter-changeable for low to high gloss coatings.  PC cable and software  Complete Kit including all essential accessories required for smooth  functioning and measuring gloss of textile, coating, ink, plastic etc.</p>	<p><b>Quotation invitation –</b>  03.12.2015  <b>Quotation Submission -</b>  18.12.2015, 14:00hrs</p> <p><b>Quotation Opening –</b>  18.12.2015, 15:00 hrs</p>
6	Lovibond Tintometer	<p>Measuring principle Visual, in terms of Lovibond® units  Modes: Transmittance, reflectance  Range 0.1 - 79.9 Red, Yellow;0.1 - 49.9 Blue; 0.1 - 3.9 Neutral  Resolution 0.1 Lovibond® unit  Optical system 11 glass-filled nylon racks containing a graduated range  of Lovibond® colour glasses  Viewing system Fully adjustable, prismatic with integral blue filter for  light</p>	<p><b>Quotation invitation –</b>  03.12.2015  <b>Quotation Submission -</b>  18.12.2015, 14:00hrs</p> <p><b>Quotation Opening –</b>  18.12.2015, 15:00 hrs</p>

		Path length Up to 153 mm (6")	
7	LCD Projector	<p><b>LCD Projector</b></p> <ul style="list-style-type: none"> <li>• Brightness: 2600 ANSI Lumens Minimum,</li> <li>• Resolution: WXGA (1280x800)</li> <li>• Laser &amp; LED Hybrid Light Source,</li> <li>• Life of Light Source 20,000 Hrs.</li> <li>• Wi-fi connectivity</li> <li>• VGA &amp; HDMI Port</li> <li>• Projector Screen: Size-8Ft. X6Ft., Wall mountable, Self Lock, High Gain</li> <li>• Warranty- Min. 3years on projector &amp; 5 years on light source.</li> </ul>	<p><b>Quotation invitation –</b> 03.12.2015</p> <p><b>Quotation Submission -</b> 18.12.2015, 14:00hrs</p> <p><b>Quotation Opening –</b> 18.12.2015, 15:00 hrs</p>
8	Gas Chromatograph -Mass Spectrometer (GC-MS)	<p><b>GAS CHROMATOGRAPH</b> Gas Chromatograph to provide all needed data including Temperature, Pressure/parameter, type of Carrier Gas, Carrier gas column pressure, flow rates, split flow. With Programmable Electronic/pneumatic Control for complete system.</p> <p><b>OVEN:</b> Temperature range : Above ambient to 450 Deg C with user selectable or better Ramp rate : Up to 45 Deg C/ min. or better Oven Cool Down : 450 to 50 Deg C within 5 minutes or better Ramps : 9 ramps or more Pneumatics Programmable Electronic control for injectors with single point control software. 0.1 min increments or better Injector: 01 No. Programmable Split/Splitless capillary Injector should have injection modes of Split and Splitless Automatic Injector device having capacity of 12 Vials or better of 2 ml capacity Injector – 01 No. 50 °C to 400 °C in 1 °C increments or better Electronic Flow Control (EFC/EPC/PPC) etc.</p> <p><b>MASS SPECTROMETER :</b></p> <ol style="list-style-type: none"> <li>1. LAN based quadrupole MS system with inert/Smart ion source. System should include turbo molecular pump with 250 L/Sec. or better capacity with EI source</li> <li>2. Mass range of 2-1000 amu in 0.1 amu steps.</li> </ol>	<p><b>Quotation invitation –</b> 03.12.2015</p> <p><b>Quotation Submission -</b> 18.12.2015, 14:00hrs</p> <p><b>Quotation Opening –</b> 18.12.2015, 15:00 hrs</p>

		<ol style="list-style-type: none"> <li>3. Mass axis stability should be 0.10 amu/48 hours.</li> <li>4. Scan speed up to 10,000 amu or better.</li> <li>5. Ion source temperature up to 350°C for better sensitivity.</li> <li>6. Transfer line temp 50-350 °C.</li> <li>7. Ionization energy range up to 70eV or better.</li> </ol> <p><b><u>Sensitivity Specifications:</u></b></p> <ol style="list-style-type: none"> <li>8. EI Full Scan sensitivity 600:1 or better</li> <li>9. Spectral libraries: (A) NIST LATEST VERSION-2014 WITH LICENCE.</li> <li>10. The system should be Quoted with all necessary utilities for GC-MS</li> <li>11. Gas cylinders (nitrogen &amp; helium), regulators (2 stage), gas purification panels, tubing's, ferrules with all necessary spares required for the GCMS operation should be quoted. Automatic leak check facility for carrier gas.</li> <li>12. Additional syringes of 5 and 10 micro liters (1 each).</li> <li>13. Calibration mixture/standard mixture -1 No.</li> </ol> <p><b><u>COMPUTER SPECIFICATION</u></b></p> <ol style="list-style-type: none"> <li>1. Suitable PC &amp; Printer for the operation of the above mentioned GCMS system should be provided.</li> <li>2. User Technical/Maintenance Manual to be supplied in ENGLISH</li> <li>3. Training for lab staff support and till familiarity with the system at our site.</li> </ol> <p><b><u>Columns:</u></b> Suitable columns for the analysis of oils , fats, allied products, antioxidants, anti nutritional components etc. of suitable length must be provided.</p> <p>Warranty : Vendor should provide minimum 1 yr warranty from the date of installation.</p>	
9	High performance , touch screen	Wavelength : 550nm, 570nm and 690nm Optics : Bi chromatic Reproducibility : R coefficient >.08; Standard deviation of < 0.005 AU	<b>Quotation invitation –</b> 03.12.2015 <b>Quotation Submission -</b>

	specialized Spectrophotometer SAFTEST- II Analyzer	when measured with 20 samples of distilled water Liquid Crystal Display : 320x240 STN LCD with Touch Screen Tube Size : 10 mm and 12 mm generic round-bottom glass or polystyrene Liquid Crystal Display : 320x240 STN LCD with 5.7" Touch Screen Adaptor : 7.5 VDC, 3.5A Input Power : 100-240 VAC, 50-60 Hz, 0.8 A Absorbance Range : 0 - 2.0 A Wavelength : 550nm, 570nm and 690nm Light Source : High-intensity LED Optics : Three optical filters on 550nm, 570nm and 690nm Bandwidth : 10nm Reproducibility : Standard deviation of < 0.005 A when measured with 20 samples of distilled water Linearity : < 0.005 A or 2% difference from calculated regression line; correlation coefficient, r= 0.9995 or better Printer : Onboard Thermal Printer, 284 dots per line, Up to 60mm/sec Paper Width / Roll Size : 58mm / Maximum 49.5mm (external diameter) Tube Size : 10 mm and 12 mm generic round-bottom glass or polystyrene Memory : 64MB RAM, 32MB Flash The instrument must include all the essential accessories required for successful installation	18.12.2015, 14:00hrs  <b>Quotation Opening –</b> 18.12.2015, 15:00 hrs
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