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Rize Çay Araştırma ve Uygulama Merkezi'nin Kurulması Teknik Yardım Projesi

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ÇAYMER Laboratuvar Cihazları Teknik Özellikleri El Kitabı

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ÇAYMER Laboratuvar Cihazları Teknik Özellikleri El Kitabı

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YÖNETİCİ ÖZETİ

ÇAYMER Çay Laboratuarının başarılı çalışması için ÇAYMER laboratuarı ekipmanlarının (Lot 3) teknik spesifikasyonları el kitabı hazırlanmıştır.

ÇAYMER laboratuar ekipmanları (Lot 3) yüklenici firma MYB Rönesans Sağlık Hizmetleri İç ve Dış Ticaret Limited Şirketi tarafından teslim edilmiş ve kurulmuştur.

“Rize Çay Araştırma ve Uygulama Merkezi” Teknik Yardım Projesi, Rize Ticaret ve Sanayi Odası tarafından Proje Grubu liderliğindeki Konsorsiyumun teknik desteği ile yürütülmüş ve Türk Çay Endüstrisi’nin rekabet gücünün artırılması öngörülmüştür.

ÇAYMER Projesi ile Rize Ticaret ve Sanayi Odası (RCCI), Rize'nin kurumsal ve operasyonel kapasitesinin geliştirilmesinin yanı sıra bölgesel rekabet gücünün artırılmasına ve hedef bölgenin sosyo-ekonomik gelişimine katkıda bulunmayı amaçlamıştır.

ÇAYMER tarafından sunulan hizmetlerin kalitesini sağlamak için, aşağıdaki bileşenler ÇAYMER'in iyi işleyişini sağlamak için büyük önem taşımaktadır:

1. Kapsamlı bir İzleme ve Değerlendirme (M & E) Sistemi ve buna uygun stratejilerin geliştirilmesi ve uygulanması
2. ÇAYMER Yönetiminin Eğitimi
3. Etkin Kalite Yönetim Sistemi
4. Laboratuar Ekipmanlarında ve Makinelerde Verimlilik
5. Çay üreticileri, KOBİ’ler, ihracatçılar ve diğer paydaşların üretim, yeni ürün geliştirme, Ar-Ge, analiz ve danışmanlık ihtiyaçlarını karşılamak ve sektörün gelişimine katkıda bulunmak

ÇAYMER projesi, Türk Çay Endüstrisinin mevcut ve ortaya çıkan sorunlarına sürdürülebilir bir çözüm sunmak üzere tasarlanmıştır. ÇAYMER;

1. Çay üretim ve ürün standartlarını oluşturmak
2. Çay üretim süreçlerini optimize etmek
3. Çay ve çay ürünlerinin test edilmesi ve özellikle küresel pazarlardaki diğer rakiplerle rekabet edebilmek için farklı müşteri ihtiyaçlarına yönelik farklı ürün çeşitlerini yerel ve uluslararası pazarlar için geliştirmek
4. “Sürdürülebilir Çay Üretimi” tekniklerini geliştirmek ve yaymak
5. Türk çay sektörünün uluslararası rakiplere karşı pazarlama, ihracat ve inovasyon yeteneğini arttırmak
6. Türk çay sektörünün verimliliğini ve kalitesini arttırmak
7. Çay sektörünün aktörleri arasındaki işbirliğini ve koordinasyonu geliştirmek

Bu belge, TRAC Laboratuar cihazlarının en önemli teknik özelliklerini vermektedir.

ÇAYMER Laboratuar ekipmanları teknik özellikleri el kitabı, kıdemli tarım gıda endüstri uzmanı Yusuf Tokdemir tarafından 2018 Temmuz tarihinde ÇAYMER TAT Takım Lideri Prof. Stephen J A Newton'un gözetimi altında çalışılmış ve hazırlanmıştır.

ÇAYMER LABORATUAR CİHAZLARININ TEKNİK ÖZELLİKLERİ

Cihazların teknik özellikleri orijinal dökümana bağlı kalmak suretiyle İngilizce olarak aşağıda verilmiştir:

1. Item Number	2. Specifications Required	3. Specifications Offered
3.1	**FLAME PHOTOMETER**	**FLAME PHOTOMETER**
	Manufacturer's name/Country of origin:	**Jenway /United Kingdom**
	Product type, model:	**PFP7**
	Shall be designed for determinations of Sodium (Na), Potassium (K), Calcium (Ca), Barium (Ba) and Lithium (Li)	The device is designed for determinations of Sodium (Na), Potassium (K), Calcium (Ca), Barium (Ba) and Lithium (Li)
	Shall be supplied with minimum one each of Na+, K+, Ca+, Li+, and Ba+ filters	The device will be supplied with one each of Na+, K+, Ca+, Li+, and Ba+ filters
	Measurement interval: from 0 to 199.9 ppm or more	Measurement interval: from 0 to 199.9 ppm
	Linearity: ± 2 % or less	Linearity: better than ± 2 %
	Specificity: less than 0.5%	Specificity: less than 0.5%
	Limits of detection: Na ≤ 0.2ppm , K ≤ 0.2ppm, Li ≤ 0.25ppm, Ca ≤ 15ppm, Ba ≤ 30ppm	Limits of detection: Na ≤ 0.2ppm , K ≤ 0.2ppm, Li ≤ 0.25ppm, Ca ≤ 15ppm, Ba ≤ 30ppm
3.2	**FUME HOOD**	**FUME HOOD**
	Manufacturer's name/Country of origin:	**Enlab / Turkey**
	Product type, model:	**Fume Hood**
	Body structure: Double walled corrosion resistant galvanised steel	Body structure: Double walled corrosion resistant galvanised steel
	Internal dimensions of working cabin (WxDxH): 1200±200mm x 700 ±200mm x min 800mm	Internal dimensions of working cabin (WxDxH): 1200±200mm x 700 ±200mm x min 800mm
	Workbench shall be 304L Quality stainless steel	Workbench is 304L Quality stainless steel
	Shall have aspiration and lightning system	The device has aspiration and lightning system
	Min. 2 power outlet (220 V)	2 power outlet (220 V)
	Fume hood's aspiration system shall have minimum 1000 m^3/h capacity and maximum 65 dBA noise level	Fume hood's aspiration system has 1300 m^3/h capacity and 65 dBA noise level
	Internal dimensions of working cabin (WxDxH): 1200±200 mm x 700±100 mm x 700 ±100 mm	Internal dimensions of working cabin (WxDxH): 1190 mm x 700 mm x 700 mm
	Shall have 1 cold water and 1 gas tap according to DIN-EN 12920 or equivalent standards	The device has 1 cold water and 1 gas tap according to DIN-EN 12920
	Shall have chemical storage cabin below	The device has chemical storage cabin below
3.3	**HOMOGENIZER**	**HOMOGENIZER**
	Manufacturer's name/Country of origin:	**IKA / Germany**
	Product type, model:	**T 25 Digital**
	Working interval: 5.000 to 24.000 rpmor wider range	Working interval: 3.000 to 25.000 rpm
	Should have digital rpm display.	The device has digital rpm display.
	Shall be used on a fixed stand and portable	The device is used on a fixed stand and portable
	Shall be used with min. 10 different shafts. The shafts shall be sterilised properly	The device is used with 16 different shafts. The shafts can be sterilised properly
	Working capacity: 1 ml to 1000 ml	Working capacity: 1 ml to 2000 ml
	Work heads diameter range: 10 to 20 mm	Work heads diameter range: 10 to 20 mm

1. Item Number	2. Specifications Required	3. Specifications Offered
	Minimum 8 different tools can be attachable. A single tool/probe with a diameter of 10-12mm with a shaft length of 100-180mm shall be supplied.	Minimum 16 different tools can be attachable. A single tool/probe with a diameter of 10 mm with a shaft length of 105 mm will be supplied
	noise level: maximum 75 dB	noise level: 75 dB
3.4	**DESKTOP PH METER**	**DESKTOP PH METER**
	Manufacturer's name/Country of origin:	**Elmetron / Poland**
	Product type, model:	**CP-505**
	Control: Microprocessor controlled with digital display	Control: Microprocessor controlled with digital display
	Includes electrode (probe) for pH measurement of solid food	Includes electrode (probe) for pH measurement of solid food
	Measurement capability: pH, millivolt , ORP and temperature	Measurement capability: pH, millivolt , ORP and temperature
	pH measuring Range: between 0-14 with pH probe Resolution: maximum 0,01	pH measuring Range: -2 to 16 with pH probe Resolution: 0,01 or 0,001
	mV measuring capacity: -1500 to +1500 mV with max. ±1 mV sensitivity	mV measuring capacity: -1999,9 to +1999,9 mV with ±0,1 mV sensitivity
	ORP range: ±1200 mV and resolution 0,1 mV	ORP range: ±1999,9 mV and resolution 0,1 mV
	ºC measuring capacity: 0 to +99,9 or wider range	ºC measuring capacity: -50 to +199,9
	Should be provided with an electrode holder/arm	Will be provided with an electrode holder/arm
	Should include the electrodes with pH, mV and ºC measuring capability, automatic reading	The device include the electrodes with pH, mV and ºC measuring capability, automatic reading
	Should have Automatic calibration facility	The device has Automatic calibration facility
	Following items shall be provided with the device: Liquid filling pH electrode with cablepH 4,01, ph 7,0, pH 10,00 buffer solutions in 500 ml bottles batteries and adaptor	Following items will be provided with the device: Liquid filling pH electrode with cable pH 4,01, ph 7,0, pH 10,00 buffer solutions in 500 ml bottles batteries and adaptor
3.5	**PORTABLE PH METER**	**PORTABLE PH METER**
	Manufacturer's name/Country of origin:	**Elmetron /Poland**
	Product type, model:	**CP-401**
	Type: Microprocessor controlled, hand type and water proof	Type: Microprocessor controlled, hand type and water proof
	Should have LCD or LED display showing pH and temperature values	The device has LCD display showing pH and temperature values
	pH measuring range: 0 to 14	pH measuring range: -2 to 16
	temperature range:. 0 to +60 º C or wider range	temperature range:. -50 to +199,9 º C
	Memory capacity: For holding min. 300 measurements (stored manual or automatic on the memory). Stored data shall be transferable to a computer to cvs or xls formats.	Memory capacity: For holding 4000 measurements (stored manual or automatic on the memory). Stored data can be transferable to a computer to cvs or xls formats.
	Shall make pH, ORP and temprature measurements.	The device make pH, ORP and temprature measurements.
	Shall have automatic calibration feature.	The device has automatic calibration feature.

1. Item Number	2. Specifications Required	3. Specifications Offered
	Following items shall be provided with the device: pH electrode, temperature probe, batteries, carrying case and pH 4,01, ph 7,01, pH 10,00 buffer solutions in 500 ml bottles	Following items will be provided with the device: pH electrode, temperature probe, batteries, carrying case and pH 4,01, ph 7,01, pH 10,00 buffer solutions in 500 ml bottles
3.6	**STERILIZER**	**STERILIZER**
	Manufacturer's name/Country of origin:	**NÜVE / Turkey**
	Product type, model:	**FN 500**
	dry air laboratory type sterilizer	dry air laboratory type sterilizer
	Temperature adjustment: from 5 °C above ambient temp. to 250ºC or wider range	Temperature adjustment: from 5 °C above ambient temp. to 250ºC
	Internal volume: min. 100 litres	Internal volume: 120 litres
	Control: Microprocessor controlled and has digital display	Control: Microprocessor controlled and has digital display
	Time and temperature programmable digitally	Time and temperature programmable digitally
	Min. 2 standard shelves shall be given with the device	2 standard shelves will be given with the device
3.7	**CRUSHING MILL**	**CRUSHING MILL**
	Manufacturer's name/Count of origin:	**Fritsch / Germany**
	Product type, model:	**Pulverisette 15**
	Usage: Suitable for plant grinding	Usage: Suitable for plant grinding
	Operation principle:cutting	Operation principle:cutting
	Sample container capacity: minimum 250 ml	Sample container capacity: 3500 ml
	Should have overload protection	The device has overload protection
	Cutting chamber and cutter shall be stainless steel	Cutting chamber and cutter is stainless steel
	Motor input: min 600W	Motor input: 2150W
3.8	**VACUUM PUMP**	**VACUUM PUMP**
	Manufacturer's name/Country of origin:	**Vacuubrand /Germany**
	Product type, model:	**MZ2C NT+2AK**
	Technology: non-oil	Technology: non-oil
	Usage: Chemical vapour pumping on distillation, evaporation, drying, etc.	Usage: Chemical vapour pumping on distillation, evaporation, drying, etc.
	Flow speed: minimum 2.0 m^3/h	Flow speed: 2.0 m^3/h
	Motor speed: min 1500 rpm	Motor speed: 1500 rpm
	Ultimate vacuum: minimum 7 mbar	Ultimate vacuum: 7 mbar
	Quantity of collection balloons: One at entry and one at exit	Quantity of collection balloons: One at entry and one at exit
	Collection containers structure: Made of protective covered glass	Collection containers structure: Made of protective covered glass
	Establishment: On a stand together with entry and exit containers	Establishment: On a stand together with entry and exit containers
	Quantity of desiccators: 2 pcs	Quantity of desiccators: 2 pcs
3.9	**CHEMICAL STORAGE CABINET**	**CHEMICAL STORAGE CABINET**
	Manufacturer's name/Country of origin:	**Enlab / Turkey**
	Product type, model:	**Chemical Storage Cabinet**
	Dimensions: 115+/-5 cm width x 63 +/- 3 cm deep x 210+/-10 cm height	Dimensions: 115 cm width x 63 cm deep x 210 cm height
	Door type: Two equal width full height lockable doors on front	Door type: Two equal width full height lockable doors on front
	Body structure: epoxy electrostatic dust paint	Body structure: epoxy electrostatic dust paint

1. Item Number	2. Specifications Required	3. Specifications Offered
	Should have chimney connection exit	The cabinet has chimney connection exit
	Should have filtered air inlets on the doors	The cabinet has filtered air inlets on the doors
	Shelves: minimum 4x replaceable	Shelves: 4x replaceable
	Functionalities: Open/close switch, motor, active light and electricity power jack	Functionalities: Open/close switch, motor, active light and electricity power jack
3.10	**INDUCTIVE COUPLED PLASMA MASS SPECTROMETER(ICP MS)**	**INDUCTIVE COUPLED PLASMA MASS SPECTROMETER(ICP MS)**
	Manufacturer's name/Country of origin:	**Agilent Technologies/ Germany**
	Product type, model:	**ICP-MS, 7900**
	ICP-MS shall consist of following components and accessories: sample feeding unit and ICP ion source, Ion focus system and quadrupole mass analyser, interference removal unit, MS detection system, vacuum system, autosampler, PC, ICP-MS software, microwave digestion system (for sample preparation).	Agilent 7900 ICP-MS system consists of following components and accessories: sample feeding unit and ICP ion source, Ion focus system and quadrupole mass analyser, interference removal unit, MS detection system, vacuum system, autosampler, PC, ICP-MS software microwave digestion system (for sample preparation).
	The system shall work in conformity with hardware/software and interfaces. The system shall be capable of calibration for qualitative and quantitative measurements. The system should be bench top.	Agilent 7900 ICP-MS system works in conformity with hardware/software and interfaces. Agilent 7900 ICP-MS system is capable of calibration for qualitative and quantitative measurements.Agilent 7900 ICP-MS system is bench top.
	Performance specifications; No gas mode /STD mode Sensitivity(kcps/ppb): ^{7}Li minimum 50 Detection limit (ppt): ^{9}Be ≤ 0,5 Oxide(%): CeO/Ce ≤ 2 Stability(%RSD): ≤ 3(2 hours) or in long term	Agilent 7900 ICP-MS system has fallowing performance specifications; No gas mode /STD mode Sensitivity(kcps/ppb): 7Li minimum 55 Detection limit (ppt): 9Be ≤ 0,2 Oxide(%): CeO/Ce ≤ 1,5 Stability(%RSD): ≤ 3(2 hours).
	Performance specifications; He gas/cell mode Sensitivity(kcps/ppb): for element Co: minimum 30	Agilent 7900 ICP-MS system has fallowing performance specifications; He gas/cell mode Sensitivity(kcps/ppb): for element Co: minimum 65
	<u>Sample introduction system:</u> Peristaltic pump: minimum 10 roller, minimum 3 channels Nebulizer:borosilicate glass or PFA Spray chamber: quartz or PFA	<u>Agilent 7900 ICP-MS sample introduction system:</u> Peristaltic pump: 10 roller, minimum 3 channels Nebulizer:borosilicate glass Spray chamber: quartz
	<u>Plasma:</u> RF generator: Solid state digital drive with variable/dynamic frequency impedance matching Torch: one piece, quartz Injector: 2.5 mm ID injector, quartz Mass flow controllers (Ar): minimum 3	<u>Agilent 7900 ICP-MS plasma</u>: RF generator: Solid state digital drive with variable frequency impedance matching Torch: one piece, quartz Injector: 2.5 mm ID injector, quartz Mass flow controllers (Ar): 4 (plasma, Aux., Carrier, Make up/Dilution).
	<u>Interface</u> Sample cone: Ni tipped, 1 or 1.1 mm diameter orifice Skimmer cone: Ni tipped, 0.4 or 0.5 mm diameter orifice	<u>Agilent 7900 ICP-MS Interface</u> Sample cone: Ni tipped, 1 mm diameter orifice Skimmer cone: Ni tipped, 0.4 mm diameter orifice.

1. Item Number	2. Specifications Required	3. Specifications Offered
	Ion optics: Shall have off-axis lens	Agilent 7900 ICP-MS Ion optics: Agilent 7900 ICP-MS hasoff-axis lens.
	Collision/Reaction System He cell gas MFC shall be included to the system	Collision/Reaction System Agilent 7900 ICP-MS hasHe cell gas MFC included to the system
	Mass analyzer: Quadrupole: hyperbolic rods Mass range: 4 to 260 u or wider Mass stability: ≤ 0.05 u per day (8 hours shift)	Mass analyzer of 7900 ICP-MS system: Quadrupole: hyperbolic rods Mass range: 2 to 260 u Mass stability: ≤ 0.05 u per day (8 hours shift)
	Detector: Dynamic range ≥ 9 orders	Detector: Dynamic range 11 orders
	Vacuum system: Three stage differential vacuum system with split flow turbo pump and external rotary pump	Agilent 7900 ICP-MS Vacuum system: Three stage differential vacuum system with split flow turbo pump and external rotary pump
	Autosampler Shall have min. 150 auto sampling capacity.	Autosampler Agilent 7900 ICP-MS system has up to360 auto sampling capacity
	PC Shall be compatible with the system requirements and ICP-MS software. Pc shall have minimum 15 inch LCD or LED monitor, keyboard and mouse	PC Agilent 7900 ICP-MS has PC compatible with the system requirements and ICP-MS software. PC of Agilent 7900 ICP-MS systemhas minimum 15 inch LCD monitor, keyboard and mouse
	ICP-MS Software Instrument control software for controlling all components of the system, acquisition and data analyses.	ICP-MS Software Instrument control software of Agilent 7900 ICP-MS for controlling all components of the system, acquisition, and data analyses.
	The following will be provided together with the standard parts of ICP-MS device. 12 peristaltic pump tubing for sample input 12 peristaltic pump tubing for drain 12 peristaltic pump tubing for internal standard 1 pc. 100 ml 10 ppm including at least 26 element (mix) standard and 1 Hg standard shall be provided. 1 pc 50 lt filled argon gas tube (with regulators) and 1 pc. 10 lt filled helium tube (with regulators) Gas filtration system for helium shall be provided, if required by the system. The ventilation system and aspirator shall be provided with the device.	The following will be provided together with the standard parts of Agilent 7900 ICP-MS device. 12 peristaltic pump tubing for sample input 12 peristaltic pump tubing for drain 12 peristaltic pump tubing for internal standard 1 pc. 100 ml 10 ppm including at least 26 element (mix) standard and 1 Hg standard shall be provided. 1 pc 50 lt filled argon gas tube (with regulators) and 1 pc. 10 lt filled helium tube (with regulators) Gas filtration system for helium will be provided. The ventilation system and aspirator will be provided with the device

1. Item Number	2. Specifications Required	3. Specifications Offered
	Microwave Digestion System (for sample preparation) - Will be used for sample preparation for ICP-MS, and compliance with EPA method 3052 (or equivalent) - Microwave output power: minimum 1400 watt, delivered from 2 magnetrons - Cavity volume: minimum 60 liters - Cavity material: stainless steel with multilayer fluoropolymer or PTFE coating - Segmented rotor with 8 or 10 vessels with 100 ml volume (maximum pressure: minimum 100 bar, maximum temperature: minimum 250 ^{o}C)	Ethos UP Microwave Digestion System (for sample preparation) - Will be used for sample preparation for ICP-MS, and compliance with EPA method 3052 (or equivalent) - Microwave output power: 1800 watt, delivered from 2 magnetrons - Cavity volume: minimum 70,5 liters - Cavity material: stainless steel with multilayer PTFE coating Segmented rotor with 15 vessels with 100 ml volume (maximum pressure:100 bar, maximum temperature: 300^{o}C)
3.11	**KJELDAHL DISTILLATION AND BURNING UNIT**	**KJELDAHL DISTILLATION AND BURNING UNIT**
	Manufacturer's name/Country of origin:	**Gerhardt / Germany**
	Product type, model:	**VAP 200**
	Distillation unit shall have digital monitor and touchscreen	Distillation unit has digital monitor and touchscreen
	All programme steps, error messages shall be monitored with the screen	All programme steps, error messages is monitored with the screen
	Glass covered or technopolymer front panel to monitor distillation process.	Glass covered front panel to monitor distillation process.
	Steam generator shall produce steam constantly and have over heating protection.	Steam generator produce steam constantly and have over heating protection.
	Distillation unit shall be microprocessor controlled and shall have the following program steps: Reaction time/ Distillation time / Steam power (%35-100 range)	Distillation unit is microprocessor controlled and has the following program steps: Reaction time/ Distillation time / Steam power (%10-100 range)
	Programmable Distillation time.	Programmable Distillation time.
	Kjeldahl distillation: maximum 10 minutes	Kjeldahl distillation: 2-4 minutes
	Burning Unit	Burning Unit
	Capacity: Process min. 8 samples at the same time	Capacity: Process 8 samples at the same time
	Steel and isolated exterior.	Steel and isolated exterior.
	Shall have digital thermostat adjustable up to 420 °C	It has digital thermostat adjustable up to 430 °C
	Shall use 100,250 or 300,750 ml burning tubes or min 100, 400 ml burning tubes or more	It use 100,250 ml burning tubes
	Burning unit shall hold min 8 pcs of 250 or 300 ml or 400ml tubes. Tank for 800 ml tubes shall be given separately.	Burning unit hold 8 pcs of 250 tubes. Tank for 800 ml tubes will be given separately.
	Heater where the tubes are placed shall be isolated	Heater where the tubes are placed is isolated
	Shall have digital heat control unit.	It has digital heat control unit.
3.12	**MICROPLATE SPECTROPHOTOMETER**	**MICROPLATE SPECTROPHOTOMETER**
	Manufacturer's name/Country of origin:	**Thermo Fisher Scientific / Finland**

1. Item Number	2. Specifications Required	3. Specifications Offered
	Product type, model:	**Varioskan LUX**
	Monochromator based microplate absorbance reader with cuvette port and a computer. Shall be able to measure Absorbance, Fluorescent and Luminescence	Monochromator based microplate absorbance reader with cuvette port and a computer. It can measure Absorbance, Fluorescent and Luminescence
	Read Method: End-point, enzyme kinetics, spectral scanning	Read Method: End-point, enzyme kinetics, spectral scanning
	plate type: min. 6 to 384 well plates	plate type: 6 to 384 well plates for absorbance, 6 to 1536 well plates for fluorescence and luminescence
	Shaking options (as minimum): Linear and/or orbital	Shaking type: orbital
	Light source: Xenon flash lamp	Light source: Xenon flash lamp
	Wavelenght selection: Monochromator	Wavelenght selection: Monochromator
	For absorbance measurements; Wave length range: 250 to 999 nm or wider range For fluorescence measurements: Emission: 270-750 nm or wider range For luminescence measurements: Wave length range: 360 to 670nm nm or wider range Reading speed : for 96 pcs plates max. 15 sec, for 384 pcs plates max. 45 sec.	For absorbance measurements; Wavelength range: 200 to 1000 nm For fluorescence measurements: Emission: 270-840 nm For luminescence measurements: Wavelength range: *360* to 670 nm Reading speed : for 96 well plates in 15 sec, for 384 well plates in 45 sec.
	Shall include software for controlling all functions via computer. The software shall have shortcut buttons for incubator, shaking and close-open functions of the micro plate store The software shall have Abs, UV-Abs and shall be able to perform data analysis with these modes for Endpoint, Kinetic and Spectral scanning Computer shall be compatible with the system requirements and software, and have minimum 15 inch LCD or LED monitor, keyboard and mouse	Will be included SkanIT software for controlling all functions via computer. The software has shortcut buttons for incubator, shaking and close-open functions of the micro plate store The softwarehas Abs, UV-Abs and can perform data analysis with these modes for Endpoint, Kinetic and Spectral scanning Computer will be compatible with the system requirements and software, and have minimum 15 inch LCD or LED monitor, keyboard and mouse
3.13	**ANALYTICAL SCALE**	**ANALYTICAL SCALE**
	Manufacturer's name/Country of origin:	**Radwag / Poland**
	Product type, model:	**AS 220.R2**
	Interfaces: PC and printer connection via RS232 and/or USB	Interfaces: PC and printer connection via RS232 and USB
	Display: LCD or LED	Display: LCD
	Pan size : 90± 20 mm diameter or equivalent area for square pans	Pan size : 100 mm diameter
	Capacity: 220 ± 20 g	Capacity: 220 g
	Readability(readout): maximum 0. 1 milligram	Readability(readout): 0. 1 milligram
	Linearity: ± 0.2 milligram or less	Linearity: ± 0.2 milligram

1. Item Number	2. Specifications Required	3. Specifications Offered
	Typical stabilization time: maximum 5 seconds	Typical stabilization time: 3,5 seconds
	Calibration: Automatic internal calibration	Calibration: Automatic internal calibration
3.14	**ORBITAL SHAKER TYPE 1**	**ORBITAL SHAKER TYPE 1**
	Manufacturer's name/Country of origin:	**GFL/Germany**
	Product type, model:	**3017**
	Shaking movement: Orbital	Shaking movement: Orbital
	Platform Dimensions (w*l) (minimum): 300 mm* 300 mm	Platform Dimensions (w*l): 450 mm* 450 mm
	Shall have microprocessor control	The device has microprocessor control
	Orbit distance: 15 mm or more	Orbit distance: 30 mm
	Shall have digital timer.	The device has digital timer.
	Max. loading capacity: 10 kg or more	Max. loading capacity: 15 kg
	Rotation speed range: 30 to 300 rpm	Rotation speed range: 20 to 300 rpm
	Shall have an adjustable accessory to hold different types and sizes of flasks or bottles, minimum 12 Erlenmeyer flasks(250 ml)	The device has an adjustable accessory to hold different types and sizes of flasks, 12 Erlenmeyer flasks(250 ml)
3.15	**LABORATORY TYPE PURE WATER SYSTEM**	**LABORATORY TYPE PURE WATER SYSTEM**
	Manufacturer's name/Country of origin:	**Sartorius / Germany**
	Product type, model:	**Arium Comfort I H2O-I-2-UV-T**
	Technology: Reverse Osmosis method	Technology: Reverse Osmosis method
	Tank capacity: min. 50 litres	Tank capacity: 50 litres
	Water production quality: ASTM (or equivalent), NCCLS, ISO and USP reagent TYPE 1 ultra-pure	Water production quality: ASTM, NCCLS, ISO and USP reagent TYPE 1 ultra-pure
	Control: Microprocessor controlled, on control panel for required settings	Control: Microprocessor controlled, on control panel for required settings
	Shall include pre-treatment cartridge and reverse osmosis cartridge and 0.2 micron membrane filter for three level operation	The device includes pre-treatment cartridge and reverse osmosis cartridge and 0.2 micron membrane filter for three level operation
	Production capacity: min. 15 litres / hour	Production capacity: 16 litres / hour
	Screen display function: Shows treatment percentage and/or tank level	Screen display function: Shows tank level
	Interfaces: Printer connection interface and port for a removable media for cross analysis and storing of technical results	Interfaces: Printer connection interface and port for a removable media for cross analysis and storing of technical results
3.16	**CALCIMETER**	**CALCIMETER**
	Manufacturer's name/Country of origin:	**Eijkelkamp / Netherlands**
	Product type, model:	**0853**
	Calcimeter shall be capable of measuring the percentage of calcite in soil in accordance with scheibler Method, ISO 10693 and DIN 18129	Calcimeter is capable of measuring the percentage of calcite in soil in accordance with scheibler Method, ISO 10693 and DIN 18129
	Capacity of HCI chamber: at least 4 ml.	Capacity of HCI chamber: 7 ml.

1. Item Number	2. Specifications Required	3. Specifications Offered
	The device shall have glass pipes, plastic hoses, water compartment, filtering flask and rubber plugs.	The device has glass pipes, plastic hoses, water compartment, filtering flask and rubber plugs.
	Thermometer, barometer, hygrometer with mechanical gouge (The thermometer(-10 and +50 oC) and pressure shall have separate gauges.) 100 pcs test tubes 10 pc. plastic calcimetre tube 50 pc. 100cc bottles 10 pc 250 ml Erlenmayer flasks shall be provided with the device.	Thermometer, barometer, hygrometer with mechanical gouge (The thermometer(-10 and +50 oC) and pressure shall have separate gauges.) 100 pcs test tubes 10 pc. plastic calcimetre tube 50 pc. 100cc bottles 10 pc 250 ml Erlenmayer flasks will be provided with the device.
3.17	**HAND AUGER SET**	**HAND AUGER SET**
	Manufacturer's name/Country of origin:	**Eijkelkamp / Netherlands**
	Product type, model:	**0111SO**
	Shall be designed for manual drilling and sampling in different soils and be capable of sampling min. 5 m depth	The device is designed for manual drilling and sampling in different soils and be capable of sampling 5 m depth
	Shall be used for augering all types of soil	The device is used for augering all types of soil
	Shall include Edelman augers in various types, one piece of riverside auger with 7-8 cm diameter, one piece of auger for stony ground, one piece of spiral auger, one piece of bailer, one piece of gauge auger with bent spatula	The device includes Edelman augers in various types, one piece of riverside auger with 7-8 cm diameter, one piece of auger for stony ground, one piece of spiral auger, one piece of bailer, one piece of gauge auger with bent spatula
	Shall include a sounding device.	The device includes a sounding device.
	Shall include 5 meters measuring tape, one piece of nylon headed hammer, one piece of brush, one piece of shovel.	The device includes 5 meters measuring tape, one piece of nylon headed hammer, one piece of brush, one piece of shovel.
3.18	**SIEVE SHAKER**	**SIEVE SHAKER**
	Manufacturer's name/Country of origin:	**Retsch / Germany**
	Product type, model:	**AS 200**
	Sieving type: Wet and dry	Sieving type: Wet and dry
	Sieving capacity: 3 levels	Sieving capacity: 3 levels
	Maximum shaking height: 3 mm	Maximum shaking height: 3 mm
	Sieve diameter: 200mm (+/- %5)	Sieve diameter: 200mm
	Sieve height: 50 mm (+/- %5)	Sieve height: 50 mm
	Simultaneous shaking capacity: 8 sieves	Simultaneous shaking capacity: 8 sieves
	Sieve type range: 20 micron to 25 mm	Sieve type range: 20 micron to 25 mm
	Shaking duration range: up to 15 minutes and continuous	Shaking duration range: up to 15 minutes and continuous
	Shaking type: Continuous and periodic, adjustable	Shaking type: Continuous and periodic, adjustable
	Should have vibration adjustment control	The device has vibration adjustment control
	Type of legs: Rubber as preventing movement during operation	Type of legs: Rubber as preventing movement during operation

1. Item Number	2. Specifications Required	3. Specifications Offered
3.19	**AUTOMATIC PIPETTE SET – TYPE 1**	**AUTOMATIC PIPETTE SET – TYPE 1**
	Manufacturer's name/Country of origin:	**Brand/ Germany**
	Product type, model:	**Transferpette S D-10, D-100, D-1000**
	Each set Shall include 3 pipettes of different volumes	Each set includes 3 pipettes of different volumes
	Volumes: 0.5-10 ul, 10-100 ul, 100-1000 ul	Volumes: 0.5-10 ul, 10-100 ul, 100-1000 ul
	Functionalities: Continuous piston stroke, volume adjustable	Functionalities: Continuous piston stroke, volume adjustable
	Control button: 2 levels, one level for liquid taking and distribution, other level for discharging all liquid including the ones left at tip	Control button: 2 levels, one level for liquid taking and distribution, other level for discharging all liquid including the ones left at tip
	Pipette contain amount: Adjustable by volume control and visible during operation	Pipette contain amount: Adjustable by volume control and visible during operation
	Tip selection: Via control button	Tip selection: Via control button
	Tip discharging: Via control button	Tip discharging: Via control button
	Volume accuracy: For 0,5-10ul: max. 1% For 10-100, 100-1000 ul: max. 0,6%	Volume accuracy: For 0,5-10ul: 1% For 10-100, 100-1000 ul: 0,6%
3.20	**AUTOMATIC PIPETTE SET – TYPE 2**	**AUTOMATIC PIPETTE SET – TYPE 2**
	Manufacturer's name/Country of origin:	**Brand/ Germany**
	Product type, model:	**Transferpette S D-20, D-200, D-1000**
	Each set Shall include 3 pipettes of different volumes	Each set includes 3 pipettes of different volumes
	Volumes: 2-20 µl, 20-200 µl, 200-2000 µl or alternatively2-20 µl, 20-200 µl and 100-1000 µl	Volumes: 2-20 µl, 20-200 µl and 100-1000 µl
	Functionalities: Continuous piston stroke, volume adjustable	Functionalities: Continuous piston stroke, volume adjustable
	Control button: 2 levels, one level for liquid taking and distribution, other level for discharging all liquid including the ones left at tip	Control button: 2 levels, one level for liquid taking and distribution, other level for discharging all liquid including the ones left at tip
	Pipette contain amount: Adjustable by volume control and visible during operation	Pipette contain amount: Adjustable by volume control and visible during operation
	Tip selection: Via control button	Tip selection: Via control button
	Tip discharging: Via control button	Tip discharging: Via control button
	Volume accuracy: For 2-20µl: max. 0,8% For 20-200, 100-1000 µl: max. 0,6%	Volume accuracy: For 2-20µl: 0,8% For 20-200, 100-1000 µl: 0,6%
3.21	**AUTOMATIC PIPETTE SET – TYPE 3**	**AUTOMATIC PIPETTE SET – TYPE 3**
	Manufacturer's name/Country of origin:	**Brand/ Germany**
	Product type, model:	**Transferpette S D-5000, D-10000**
	Each set Shall include 2 pipettes of different volumes	Each set includes 2 pipettes of different volumes
	Volumes: 1000-5000 ul, 5000-10000 ul	Volumes: 500-5000 ul, 1000-10000 ul

1. Item Number	2. Specifications Required	3. Specifications Offered
	Functionalities: Continuous piston stroke, volume adjustable	Functionalities: Continuous piston stroke, volume adjustable
	Control button: 2 levels, one level for liquid taking and distribution, other level for discharging all liquid including the ones left at tip	Control button: 2 levels, one level for liquid taking and distribution, other level for discharging all liquid including the ones left at tip
	Pipette contain amount: Adjustable by volume control and visible during operation	Pipette contain amount: Adjustable by volume control and visible during operation
	Tip selection: Via control button	Tip selection: Via control button
	Tip discharging: Via control button	Tip discharging: Via control button
	Volume accuracy: maximum 0.8%	Volume accuracy: 0.6%
3.22	**SOIL STIRRER**	**SOIL STIRRER**
	Manufacturer's name/Country of origin:	**Erkaya / Turkey**
	Product type, model:	**Small Grinder Soil Stirrer**
	Purpose:The soil stirring device for the mixing of soil/water solutions should use an electrically powered four part blade.	Purpose:The soil stirring device for the mixing of soil/water solutions should use an electrically powered four part blade.
	Number of rotations: Shall be set to min. 3 different speed levels between 10.000 – 17.000 rpm.	Number of rotations: It can set to 3 different speed levels between 10.000 – 17.000 rpm.
	Shall be fitted with an automatic start/stop function.	The device is fitted with an automatic start/stop function.
	The soil stirring apparatus is supplied with a mixing beaker with a capacity of 1 liter.	The soil stirring apparatus is supplied with a mixing beaker with a capacity of 1 liter.
3.23	**DIGITAL BURETTE 50 ML**	**DIGITAL BURETTE 50 ML**
	Manufacturer's name/Country of origin:	**VWR-Jencons / United Kingdom**
	Product type, model:	**Digitrate- Pro 50 ml**
	Accuracy: maximum +-0.2 %	Accuracy: +-0.2 %
	Precision: maximum 0.1 %	Precision: 0.1 %
	Resolution:maximum 0,01 ml	Resolution: 0,01 ml
	Should have LCD or LED monitor	It has LCD monitor
	Shall be autoclavable at 121 ^{o}C.	It can be autoclavable at 121 ^{o}C.
	Should have "zero" resets allowing multiple titrations and have bubble free dispensing	It has "zero" resets allowing multiple titrations and have bubble free dispensing
3.24	**CENTRIFUGAL MILL**	**CENTRIFUGAL MILL**
	Manufacturer's name/Country of origin:	**Retsch / Germany**
	Product type, model:	**ZM 200**
	Usage: For milling hard and fragile materials, spices, raw material, , cellulose, plant and cereal particles, feed, food and fat particles.	Usage: For milling hard and fragile materials, spices, raw material, , cellulose, plant and cereal particles, feed, food and fat particles.
	Functions: Stroke (impact) and milling by smashing (shear)	Functions: Stroke (impact) and milling by smashing (shear)
	Milling capacity: Up to minimum 40 micron	Milling capacity: Up to 40 micron
	Batch size(feed capacity): minimum 250 ml	Batch size(feed capacity): 300 ml
	Collector capacity: min. 750 ml	Collector capacity: 900 ml

1. Item Number	2. Specifications Required	3. Specifications Offered
	Milling rotor and sieve structure: Stainless steel	Milling rotor and sieve structure: Stainless steel
	Milling rotor speed: Up to minimum 15,000 rpm, adjustable	Milling rotor speed: Up to 18,000 rpm, adjustable
	Sieve sizes: 0.08 to 6.0 mm or wider range. Two sets of each sizes between the ranges shall be provided.	Sieve sizes: 0.08 to 10.0 mm. Two sets of each sizes between the ranges shall be provided.
3.25	**SCALE**	**SCALE**
	Manufacturer's name/Country of origin:	**Radwag / Poland**
	Product type, model:	**PS 2500.3Y**
	Readabiltiy: maximum 0,01 gr	Readabiltiy: maximum 0,01 gr
	Capacity: between 2400 and 3200 gr	Capacity: 2500 gr
	Pan Size: 165 (+/- 35) mm x165 (+/- 35) mm	Pan Size: 195 mm x195 mm
	Repeatability: ±0,03 gr or less	Repeatability: ±0,01 gr
	Linearity: ±0,03 gr or less	Linearity: ±0,02 gr
	Calibration: automatic calibration	Calibration: automatic calibration
	Screen: LCD or LED Display	Screen: LCD Display
3.26	**ASH OVEN**	**ASH OVEN**
	Manufacturer's name/Country of origin:	**Protherm**
	Product type, model:	**ECO110/3**
	Shall be laboratory bench-top type.	It is laboratory bench-top type.
	Inner volume :min. between 3 liters and 7 liters	Inner volume : 3 liters
	Shall have safety key on cover door.	It has safety key on cover door.
	Shall have PID microprocessor controller.	It has PID microprocessor controller.
	The termostat adjustment sensivity:maximum 10°C.	The termostat adjustment sensivity: 10°C.
	Maximum temperature: 1000°C or more	Maximum temperature: 1100°C
	Time to maximum temperature: maximum 60 minutes	Time to maximum temperature: 60 minutes
3.27	**DISPENSER**	**DISPENSER**
	Manufacturer's name/Country of origin:	**Brand / Germany**
	Product type, model:	**Dispensette S Analog Adjustable**
	Type: Bottle type	Type: Bottle type
	Volume range: 0.5 to 50 ml or wider range. If a single dispenser does not cover the required minimum volume range, more than one dispenser shall be provided to cover these ranges.	We will provide two dispensers. First dipenser volume range: 0.5-5 ml Second dispenser volume range: 5ml-50 ml
	Shall have dosage adjustment mechanism and also have valve mechanism to prevent recirculation during priming and waste. The filling tube shall be adjustable to different size bottles. With this regard, minimum three adapters shall be supplied. One adapter shall support GL32 type.	It has dosage adjustment mechanism and also have valve mechanism to prevent recirculation during priming and waste. The filling tube is adjustable to different size bottles. With this regard, three adapters will be supplied. One adapter will support GL32 type.
	Should have crystallisation prevention facility	It has crystallisation prevention facility

1. Item Number	2. Specifications Required	3. Specifications Offered
3.28	**ULTRA PERFORMANCE LIQUID CHROMATOGRAPHY (UPLC) SYSTEM**	**ULTRA PERFORMANCE LIQUID CHROMATOGRAPHY (UPLC) SYSTEM**
	Manufacturer's name/Country of origin:	**Agilent Technologies/ Germany**
	Product type, model:	**1260 Model Liquid Chromatography**
	Ultra Performance Liquid Chromatography (UPLC) system should consist of following components and accessories (as minimum): quaternary gradient pump with integrated degasser, column oven with thermostat, autosampler, diode array detector, fluorescence detector, cobra cell unit, PC, instrument control software.	Ultra Performance Liquid Chromatography (UPLC) system consist of following components and accessories (as minimum): quaternary gradient pump with integrated degasser, column oven with thermostat, autosampler, diode array detector, fluorescence detector,cobra cell unit,PC, instrument control software.
	All components of the system should be compatible with UHPLC and HPLC applications.	All components of the system is compatible with UHPLC and HPLC applications.
	All modules except computer under the system shall be manufactured under the same brand for consistency in maintenance, calibration and software compatibility.	All modules except computer under the system will be manufactured under the same brand for consistency in maintenance, calibration and software compatibility.
	<u>Quaternary Gradient Pump:</u> Flow range: 0.2 to 8 mL/min Flow precision: less than 0,075%RSD or less than 0.02 minute SD Flow accuracy : % ±1 or less Delay volume: between 600 and 800 µL	<u>Quaternary Gradient Pump:</u> Flow range: 0.2 to10 mL/min Flow precision:≤ 0,07 %RSD or ≤ 0.02 minute SD Flow accuracy : % ±1 Delay volume : 600-900 ul and adjustable between 600 and 800 µL
	<u>Column Oven with thermostat</u> Temperature range: minimum 10 ºC below ambient temperature to 80ºC. Temperature stability: ±0.2 ºC or less Temperature accuracy: ± 0,8 ºC or less Column Capacity: minimum three 30 cm columns	<u>Column Oven with thermostat</u> Temperature range: 10 ºC below ambient temperature to 85ºC. Temperature stability: ±0.1ºC Temperature accuracy: ± 0,5ºC Column Capacity: Four 30 cm columns
	<u>Autosampler:</u> Maximum operating pressure: minimum 60 MPa Injection volume range:0.1 to 100 µl or wider The sampling capacity: min. 96 pc for 2 ml vials . Carryover: typically less than 0,1% System shall be controlled with the original software.	<u>Autosampler:</u> Maximum operating pressure: 60 MPa Injection volume range:0.1 to 100 µl The sampling capacity: 132 pc for 2 ml vials . Carryover: typically <0,004% System will be controlled with the original software.
	<u>Diode array Detector:</u> 1024-element photodiode array detection Wavelength range: 190 to 640 nm or wider Wavelength accuracy: ± 1nm or less Noise: $15x10^{-6}$ AU or lower Tool-free exchange of lamps and flow cells	<u>Diode array Detector:</u> 1024-element photodiode array detection Wavelength range:190 to 640 nm Wavelength accuracy: ± 1nm Noise:$3x10^{-6}$ AU Tool-free exchange of lamps and flow cells

1. Item Number	2. Specifications Required	3. Specifications Offered
	Fluorescence Detector: Lamp life: minimum 4000 hours Data rate: minimum 70 Hz Excitation wavelength range: at least 200-800 nm or wider Emission wavelength range: at least 300-800 nm or wider. Standard flow cell volume: 8 µl Micro flow cell should be supplied. Detector shall be controlled by the computer and the original software.	Fluorescence Detector: Lamp life: 4000 hours Data rate: minimum 74 Hz Excitation wavelength range: 200-1200 nm Emission wavelength range:200-1200 nm Standard flow cell volume: 8 µl Micro flow cell is supplied. Detector will be controlled by the computer and the original software.
	PC Shall be compatible with the system requirements and instrument control software. Pc shall have minimum 15 inch LCD or LED monitor, keyboard and mouse	PC : Will be compatible with the system requirements and instrument control software. Pc will have minimum 15 inch LCD or LED monitor, keyboard and mouse
	Instrument control software Instrument control software for controlling all components of the system, acquisition and data analyses. The software shall enable to make new methods, reload old methods, print method parameters, make calibration, calculate sample results and form reporting formats. While the analysis are going on offline or the equipment is off, software shall enable to work with the analysis data, to review on-going analysis data. The software shall enable serial analysis.	Instrument control software Instrument control software for controlling all components of the system, acquisition and data analyses. The software will enable to make new methods, reload old methods, print method parameters, make calibration, calculate sample results and form reporting formats. While the analysis are going on offline or the equipment is off, software will enable to work with the analysis data, to review on-going analysis data. The software will enable serial analysis.
3.29	**GAS CHROMATOGRAPH–TANDEM MASS SPECTROMETER (GC-MS/MS)**	**GAS CHROMATOGRAPH–TANDEM MASS SPECTROMETER (GC-MS/MS)**
	Manufacturer's name/Country of origin:	**Agilent Technologies/Germany**
	Product type, model:	**GC-MS/MS, 7000D Model**
	System consists of gas chromatograph, triple quadrupole mass spectrometer, autosampler, auto injector, column oven, computer and system software. All modules except computer under the system shall be manufactured under the same brand for consistency in maintenance, calibration and software compatibility.	System consists of gas chromatograph, triple quadrupole mass spectrometer, autosampler, auto injector, column oven, computer and system software. All modules except computer under the system will be manufactured under the same brand for consistency in maintenance, calibration and software compatibility.
	Gas chromatograph specifications:	Gas chromatograph specifications:
	Should be compatible with triple quadrupole mass spectrometer	It is compatible with triple quadrupole mass spectrometer
	Retention time repeatability: < 0.0008 Peak area repeatability: < 1 %RSD	Retention time repeatability: < 0.0008 Peak area repeatability: < 1 %RSD
	Injector: split/splitless, multi mode inlet, programmed temperature vaporization (PTV)	Injector: split/splitless, multi mode inlet, programmed temperature vaporization (PTV)
	Autosampler capacity: minimum 100 vials (2 ml)	Autosampler capacity: 150 vials (2 ml)
	Oven operating temperature range: Ambient +4 to 450 °C or wider range	Oven operating temperature range: Ambient +4 to 450 °C

1. Item Number	2. Specifications Required	3. Specifications Offered
	Oven, number of ramps/plateaus: minimum 20/20	Oven, number of ramps/plateaus: 20/20
	Should be capable of running minimum two detectors simultaneously with mass spectrometer	Gas Chromatograph can be capable of running minimum two detectors simultaneously with mass spectrometer
	Triple quadrupole mass spectrometer	Agilent 7000D Triple quadrupole mass spectrometer
	Ion source type: Electron impact ionization (EI) Should include dual filaments for EI and be programmable from 150 ºC to 350 ºC	Ion source type: Electron impact ionization (EI) The system includes dual filaments for EI and can be programmable from 150 ºC to 350 ºC
	Instrument Detection Limit: < 6 fg OFN derived at the 99% confidence level	Instrument Detection Limit: < 4 fg OFN derived at the 99% confidence level
	Shall have at least 2 quadrupole high resolution analyser which is capable of conducting analysis at the same ranges and shall have at least 10-1050 or wider range amu mass weight.	The system has 2 quadrupole high resolution analyser which is capable of conducting analysis at the same ranges and has 10-1050 amu mass weight.
	Scanning speed: min. 6000 u/s	Scanning speed: 20000 u/s
	Shall have at least one turbo molecular pump and at least one rotary pump besides the supporting system.	The system has one turbo molecular pump and one rotary pump besides the supporting system.
	Vacuum re-reading, taking into vacuum and out of vacuum shall be digitally controlled.	Vacuum re-reading, taking into vacuum and out of vacuum will be digitally controlled.
	All device controls, data gathering and diagnostics system shall be computer controlled.	All device controls, data gathering and diagnostics system will be computer controlled.
	PC Shall be compatible with the system requirements and instrument control software. Pc shall have minimum 15 inch LCD or LED monitor, keyboard and mouse	PC Will be compatible with the system requirements and instrument control software. Pc will have minimum 15 inch LCD or LED monitor, keyboard and mouse
	System software Acquisition, data handling and analysis software Database for pesticides for minimum 7500 transitions	System software Acquisition, data handling and analysis software Database for pesticides for 7500 transitions
	Followings shall be provided with the system 1 high purity helium tube and appropriate manometer and spare injectors 100 septum 5 liners for pesticide analysis	Followings will be provided with the system 1 high purity helium tube and appropriate manometer and spare injectors 100 septum 5 liners for pesticide analysis
3.30	**LIQUID CHROMATOGRAPH–MASS SPECTROMETER (LC-MS/MS) DEVICE**	**LIQUID CHROMATOGRAPH–MASS SPECTROMETER (LC-MS/MS) DEVICE**
	Manufacturer's name/Country of origin:	**Agilent Technologies/ Germany**
	Product type, model:	**1260 Liquid chromatography -6420 LC-MS/ MS mass spectrometry**
	Triple Quadrupole LC-MS/MS System: The system should consist of triple quadrupole mass spectrometer(LC/MS) , liquid chromatograph, computer and system software	Triple Quadrupole LC-MS/MS System: The system consists of triple quadrupole mass spectrometer(LC/MS), liquid chromatograph, computer and system software
	All modules except computer under the system shall be manufactured under the same brand for consistency in maintenance, calibration and software compatibility.	All modules except computer under the system will be manufactured under the same brand for consistency in maintenance, calibration and software compatibility.

1. Item Number	2. Specifications Required	3. Specifications Offered
	Liquid Chromatograph should consist of following components and accessories (as minimum): binary or double binary pump with external or integrated degasser, column oven with thermostat, autosampler and auto injector with injection capability up to min 100µL. The system shall include at least one turbomolecular pump and auxilliary vacuum pump	Liquid Chromatograph consists of following components and accessories : binary pump with external degasser, column oven with thermostat, autosampler and auto injector with injection capability up to 100µL. The system will include one turbomolecular pump and auxilliary vacuum pump
	Binary or Double Binary Pump: Operating principle: Serial dual piston Flow range: 0.2 to 5 mL/min or wider range Flow precision: less than 0,15%RSD Flow accuracy : % ±1 or less Pressure range: up to 60 Mpa (or more) Gradient formation: high pressure Proportioning (composition) accuracy: ± 0.5 % or less Degasser Number of channels: 4, Maximum flow rate per channel: minimum 10 mL/miniute	Binary or Double Binary Pump: Operating principle: Serial dual piston Flow range: 0.05 to 5 mL/min Flow precision: ≤0,07 %RSD Flow accuracy : % ±1 Pressure range: 0-60 Mpa Gradient formation: high pressure Proportioning (composition) accuracy: ± 0.35 % Degasser Number of channels: 4, Maximum flow rate per channel: 10 mL/miniute
	Column Oven with thermostat Temperature range: minimum 10 °C below ambient temperature to 80°C or wider range. Temperature accuracy: ± 0,8 °C or less Maximum column lenght: minimum 30 cm	Column Oven with thermostat Temperature range: 10 °C below ambient temperature to 85 °C. Temperature accuracy: ± 0,5 °C Maximum column lenght: 30 cm
	Autosampler: Maximum operating pressure: minimum 60 MPa Injection volume range:0.1 to 100 µl or wider The sampling capacity: min. 96 pc for 2 ml vials . Carryover: typically less than 0,1%	Autosampler: Maximum operating pressure: 60 MPa Injection volume range:0.1 to 100 µl The sampling capacity: 132pc for 2 ml vials . Carryover: typically 0,004 %
	Triple Quadrupole Mass Spectrometer Fully computer controlled, desktop, high performance triple quadrupol mass spectrometer Scanning speed: up to 5000 amu/s or less Mass range: m/z 10 to 2000 or wider range Polarity switching: maximum 30ms Ion source: ESI Electrospray Probe and ion source (cable of ionization) shall be provided with the device as a standard.	Triple Quadrupole Mass Spectrometer Fully computer controlled, desktop, high performance triple quadrupol mass spectrometer Scanning speed: 12500 amu/s (Da/s) Mass range: m/z 5 to 2250 Polarity switching:30ms Ion source: ESI Electrospray Probe and ion source (cable of ionization) will be provided with the device as a standard.
	Computer shall be compatible with the system requirements and software, and have minimum 15 inch LCD or LED monitor, keyboard and mouse,	Computer will be compatible with the system requirements and software, and have minimum 15 inch LCD or LED monitor, keyboard and mouse,
	Instrument control software Instrument control software for controlling all components of the system, acquisition and data analyses.	Instrument control software Instrument control software for controlling all components of the system, acquisition and data analyses.

1. Item Number	2. Specifications Required	3. Specifications Offered
	Shall include all starting tools for laboratory operation including 1000 pc. Vials and cap 500 pc. Quechers kit for colored samples	Will include all starting tools for laboratory operation including 1000 pc. Vials and cap 500 pc. Quechers kit for colored samples
	System shall also supplied with compatible nitrogen generator	System will also supplied with compatible nitrogen generator
3.31	**EXTRACTION SYSTEM FOR FAT DETERMINATION**	**EXTRACTION SYSTEM FOR FAT DETERMINATION**
	Manufacturer's name/Country of origin:	**Gerhardt / Germany**
	Product type, model:	**SOX 416**
	Device shall be designed to determination of fat in tea samples	Device is designed to determination of fat in tea samples
	Device shall be capable of analyzing minimum 6 samples simultaneously.	Device is capable of analyzing 6 samples simultaneously.
	Solvent recovery rate: minimum 60 %	Solvent recovery rate: 60 %
	Extraction time: maximum 60 minute	Extraction time: 60 minute
	Reproducibility: maximum ± 1 %	Reproducibility: ± 1 %
	Shall have over-temperature safety control.	It has over-temperature safety control.
	Temperature shall be controlled by microprocessor.	Temperature is controlled by microprocessor.
	The device shall be supplied with(as minimum) six test tubes, extraction container, 25 extraction thimbles, extraction thimble holders	The device will be supplied with six test tubes, extraction container, 25 extraction thimbles, extraction thimble holders
3.32	**RAW FIBRE ANALYSER FOR CELLULOSE DETERMINATION**	**RAW FIBRE ANALYSER FOR CELLULOSE DETERMINATION**
	Manufacturer's name/Country of origin:	**Velp / Italy**
	Product type, model:	**Fiwe 6**
	Device shall be designed to determination of raw cellulose fraction in tea samples including ADF and NDF determination.	Device is designed to determination of raw cellulose fraction in tea samples including ADF and NDF determination.
	Shall be capable of analyzing minimum 6 samples simultaneously.	It is capable of analyzing 6 samples simultaneously.
	Shall be supplied with one set of crucibles or fibre bags	It will be supplied with one set of crucibles or fibre bags
3.33	**MOISTURE ANALYSER**	**MOISTURE ANALYSER**
	Manufacturer's name/Country of origin:	**Radwag / Poland**
	Product type, model:	**MA 110.R**
	laboratory measuring instrument designed to determine relative humidity content in samples of various substances.	laboratory measuring instrument designed to determine relative humidity content in samples of various substances.
	Maximum drying temperature: 150 ^{o}C or more	Maximum drying temperature: 160 ^{o}C
	Maximimum weighing capacity: 100 g or more	Maximimum weighing capacity: 110 g
	Weighting sensitivity: maximum 1milligram	Weighting sensitivity: 1milligram
	Moisture readability: maximum 0.01%	Moisture readability: 0.001%
	Pan size: 90+/- 10 mm in diameter	Pan size: 90 mm in diameter
	Display: LCD or LED	Display: LCD
3.34	**UV-VIS SPECTROPHOTOMETER**	**UV-VIS SPECTROPHOTOMETER**
	Manufacturer's name/Country of origin:	**Agilent Technologies/ Germany**
	Product type, model:	**UV-VIS SPECTROPHOTOMETER, Cary 60**

1. Item Number	2. Specifications Required	3. Specifications Offered
	Cuvette compatibility: 10, 20, 30, 50 mm rectangular	Agilent Cary 60 UV-Vis cuvette compatibility: 10, 20, 30, 50 mm rectangular.
	Wave length range: 190-1100 nm	Agilent Cary 60 UV-Vis wave length range: 190-1100 nm
	Wave length repeatability(reproducibility): +/- 0.2 nm or better	Agilent Cary 60 UV-VisWave length repeatability(reproducibility): +/-0.1 nm
	Light Source: Tungsten (VIS) and/or Deuterium lamp (UV) and/or Xenon (Xe) lamp and/or Czerny-Turner monochramator and/or silicon photodiode	Agilent Cary 60 UV-VisLight Source: Xenon (Xe) lamp and Czerny-Turner monochramator and silicon photodiode
	Display parameters: result, date, time, wavelength	Agilent Cary 60 UV-VisDisplay parameters: result, date, time, wavelength
	Stray Light: For KCl Test, 190-200nm allowable range with limits: <1.0%T and/or <0.05%T at 220nm	Agilent Cary 60 UV-Vis Stray Light: For KCl Test, 190-200nm: <1.0%T and<0.05%T at 220nm
	Display: LCD or LED	Agilent Cary 60 UV-VisDisplay: LCD or LED
	Software features: All spectrophotometer functions can be controlled by PC, Windows compatible,	Agilent Cary 60 UV-VisSoftware features: All spectrophotometer functions can becontrolled by PC, Windows compatible
3.35	**REFRIGERATOR – TYPE 1**	**REFRIGERATOR – TYPE 1**
	Manufacturer's name/Country of origin:	**Siemens / Turkey**
	Product type, model:	**KG86NAW30N**
	Internal volume: min. 400 litre	Internal volume: 479 litre
	Shall have minimum 3 shelves.	It has 4 shelves.
	The gas used in cooling system and the isolation material shall not contain CFC	The gas used in cooling system and the isolation material is not contain CFC
	Type: No frost, commercial. Shall have anti-bacterial system	Type: No frost, commercial. It has anti-bacterial system
	Cooling capacity: Between +3 ºC to +10 ºC	Cooling capacity: Between +3 ºC to +10 ºC
	Functionality: Equal distribution of the internal temperature	Functionality: Equal distribution of the internal temperature
	Energy class: A+	Energy class: A+
3.36	**BLENDER**	**BLENDER**
	Manufacturer's name/Country of origin:	**Erkaya / Turkey**
	Product type, model:	**SMALL GRINDER LAB BLENDER**
	laboratory type	laboratory type
	Capacity: min.1 litre	Capacity: 2 litre
	Speed: minimum10,000 rpm	Speed: 10,000 rpm
	Container: Stainless steel	Container: Stainless steel
3.37	**ROTARY EVAPORATOR**	**ROTARY EVAPORATOR**
	Manufacturer's name/Country of origin:	**Heidolph /Germany**
	Product type, model:	**Hei-VAP Precision ML**
	System shall include heating bath, speed controlled vacuum pump, set of glassware, vertical	System includes heating bath, speed controlled vacuum pump, set of glassware, vertical
	Lift: Motor	Lift: Motor
	Heating bath material: stainless steel	Heating bath material: stainless steel
	Rotation speed range: 20 to 280 rpm adjustable	Rotation speed range: 10 to 280 rpm adjustable
	Heating capacity: min.1250 W	Heating capacity: 1300 W
	Heating bath volume: min.3 litres	Heating bath volume: 4.5 litres

1. Item Number	2. Specifications Required	3. Specifications Offered
	Heating bath temperature range: 30-180°C	Heating bath temperature range: 20-210°C
	Heating bath temperature accuracy: ±1°C or better	Heating bath temperature accuracy: ±1°C
	Sample balloon capacity: min.1 litre	Sample balloon capacity: 1 litre
	Protection class: IP 20 according to DIN EN 60529 or equivalent	Protection class: IP 20 according to DIN EN 60529
	Should have vacuum controller	It has vacuum controller
	Type of condenser: Glass	Type of condenser: Glass
	Condenser's condensation surface: minimum 1000 cm^2	Condenser's condensation surface: 1400 cm^2
3.38	**BINOCULAR MICROSCOPE**	**BINOCULAR MICROSCOPE**
	Manufacturer's name/Country of origin:	**Euromex /Holland**
	Product type, model:	**BB.1152-PL BioBlue.Lab**
	Head: Binocular, 360° rotating, 30 ° inclined, interpupillary distance range 55-70 mm	Head: Binocular, 360° rotating, 30 ° inclined, interpupillary distance range 48-75 mm
	Eyepiece:Widefield 10X/20 mm	Eyepiece:Widefield 10X/20 mm
	Objectives: DIN standard plan achromatic, magnification 4x,10x, 40x, 100x (Oil)	Objectives: DIN standard plan achromatic, magnification 4x,10x, 40x, 100x (Oil)
	Illumination: LED	Illumination: LED
3.39	**DISHWASHER**	**DISHWASHER**
	Manufacturer's name/Country of origin:	**Miele / Germany**
	Product type, model:	**PG 8583 CD**
	Type: Laboratory	Type: Laboratory
	Capacity per load: 30 flasks, 100 pipettes, 1500 test tubes (as minimum)	Capacity per load: 30 flasks, 100 pipettes, 1500 test tubes (as minimum)
	Control: 5 standard cleaning and disinfection programmes	Control: 5 standard cleaning and disinfection programmes
	Internal cabin structure: Made of stainless steel	Internal cabin structure: Made of stainless steel
3.40	**WATER DISTILLER**	**WATER DISTILLER**
	Manufacturer's name/Country of origin:	**NÜVE / Turkey**
	Product type, model:	**ND 4**
	Distilled water capacity: minimum 4 liter/hour	Distilled water capacity: 4 liter/hour
	Heating elements shall be made of stainless steel.	Heating elements is made of stainless steel.
	Condenser and evaporator shall be made of stainless steel and/or borosilicate glass material.	Condenser and evaporator shall be made of stainless steel and/or borosilicate glass material.
	Distillate storage tank shall have a capacity of at least 8 lt	Distillate storage tank has a capacity of 8 lt
3.41	**HOTPLATE**	**HOTPLATE**
	Manufacturer's name/Country of origin:	**İka / Germany**
	Product type, model:	**C-MAG HP 7**
	Heat temperature range: min. 50 to 300 °C	Heat temperature range: 50 to 500 °C
	Heat control display: LED or LCD	Heat control display: LED
	Heat control accuracy: 5±°C or more accurate	Heat control accuracy: 5±°C
	Heating plate dimensions: min. 180 x 180 mm	Heating plate dimensions: 180 x 180 mm
3.42	**MAGNETIC STIRRER**	**MAGNETIC STIRRER**
	Manufacturer's name/Country of origin:	**Velp / Italy**
	Product type, model:	**Arex**
	Magnetic stirrer with heater	Magnetic stirrer with heater
	Electronic speed control should be capable to reach minimum 1200 rpm	Electronic speed control is capable to reach 1500 rpm

1. Item Number	2. Specifications Required	3. Specifications Offered
	Heating plate: minimum 145 mm diameter or equivalent area for different shapes	Heating plate: 155 mm diameter
	Mixing capacity: minimum 20 litres (H_2O)	Mixing capacity: 20 litres (H_2O)
	Heating capacity: 300 ºC or more	Heating capacity: 370 ºC
3.43	**Item and all related technical specifications are removed from tender.**	**Item and all related technical specifications are removed from tender.**
3.44	**REFRIGERATOR- TYPE 2**	**REFRIGERATOR- TYPE 2**
	Manufacturer's name/Country of origin:	**Siemens/ Turkey**
	Product type, model:	**KG36NNL30N**
	Internal volume: min. 120 litre	Internal volume: 215 litre
	Thermostat adjustment range: 3.0 °C- 8.0 °C	Thermostat adjustment range: 3.0 °C- 8.0 °C
	Shall have minimum 2 shelves.	It has 4 shelves.
	The gas used in cooling system and the isolation material shall not contain CFC	The gas used in cooling system and the isolation material shall not contain CFC
	Type: commercial office usage. Shall have freezer	Type: commercial office usage. It has freezer
	Energy class: A+	Energy class: A++
3.45	**DENSITY METER**	**DENSITY METER**
	Manufacturer's name/Country of origin:	**Anton Paar / Austria**
	Product type, model:	**DMA 4100 M**
	Density measuring range: 0 – 3 g/cm^3	Density measuring range: 0 – 3 g/cm^3
	Density Accuracy: 0.0001 g/cm^3 or more accurate	Density Accuracy: 0.0001 g/cm^3 accurate
	Temperature range: 0 - 90 °C	Temperature range: 0 - 100 °C
	shall have temperature compensation	It has temperature compensation
	Shall have viscosity correction	It has viscosity correction
	User interface: Touchscreen	User interface: Touchscreen
3.46	**SHAKING WATER BATH**	**SHAKING WATER BATH**
	Manufacturer's name/Country of origin:	**Memmert / Germany**
	Product type, model:	**WNB 22**
	Type: Suitable to be used for sensitive temperature forward and backward shaking laboratory applications	Type: Suitable to be used for sensitive temperature forward and backward shaking laboratory applications
	Control: Microprocessor controlled and has PI temperature arrangement function	Control: Microprocessor controlled and has PI temperature arrangement function
	Internal volume: min. 20 lt	Internal volume: 22 lt
	Should have temperature display and digital adjustment with 0.1 ºC sensitivity	It has temperature display and digital adjustment with 0.1 ºC sensitivity
	Shall include a shaker apparatus with electronic speed control	It includes a shaker apparatus with electronic speed control
	Shaking apparatus capacity: Shall have minimum 12 pcs of clips of 100 ml flask Shall have minimum 6 pcs of clips of 200 mlflask Shall have minimum 6 pcs of clips of 300 ml flask Shall have minimum 5 pcs of clips of 500 ml flask	Shaking apparatus capacity: It has 12 pcs of clips of 100 ml flask It has 6 pcs of clips of 200 mlflask It has minimum 6 pcs of clips of 300 ml flask It has 5 pcs of clips of 500 ml flask
	Shaking speed: Electronically adjustable between 20 to 200 rpm or wider range or Shaking frequency: 35 to 160 strokes or wider range per minute	Shaking frequency: 35 to 160 strokes per minute
	Shaking amplitude: minimum 20 mm	Shaking amplitude: 20 mm

1. Item Number	2. Specifications Required	3. Specifications Offered
	Temperature setting: Between +10 ºC above ambient to 99 ºC	Temperature setting: Between +10 ºC above ambient to 99 ºC
	Should have punched shaking tray and minimum six 250-300 ml erlen clamps	It has punched shaking tray and six 250-300 ml erlen clamps
3.47	**DEEPFREEZE TYPE 1**	**DEEPFREEZE TYPE 1**
	Manufacturer's name/Country of origin:	**NÜVE / Turkey**
	Product type, model:	**DF 490**
	Type: Vertical type (upright) and suitable for storing biological materials for long periods	Type: Vertical type (upright) and suitable for storing biological materials for long periods
	Internal volume: min. 400 litre	Internal volume: 455 litre
	Cooling gas type: Not including CFC and HCFC	Cooling gas type: Not including CFC and HCFC
	Temperature range: -50 ºC to -85 ºC or wider range	Temperature range: -45 ºC to -86 ºC
	Control: Microprocessor controlled and has control unit on front	Control: Microprocessor controlled and has control unit on front
	Shall have minimum 3 shelves or compartments	It has 4 compartments
3.48	**ICE MACHINE**	**ICE MACHINE**
	Manufacturer's name/Country of origin:	**Scotsman / Italy**
	Product type, model:	**AF80**
	Structure: stainless steel	Structure: stainless steel
	Maximum ice production per day: 70 kg or more	Maximum ice production per day: 70 kg
	Bin capacity: 20 kg or more	Bin capacity: 25 kg
	Shall have electronic control	It has electronic control
	Ice type: flakes	Ice type: flakes
	the cooling gas of the device shall not contain CFC	the cooling gas of the device is not contain CFC
	Shall include water connection hose, spiral hose for discharging of melted ice in the storage or waste water, and ice collecting shovel	It includes water connection hose, spiral hose for discharging of melted ice in the storage or waste water, and ice collecting shovel
3.49	**PHASE-CONTRAST BINOCULAR INVERTED MICROSCOPE**	**PHASE-CONTRAST BINOCULAR INVERTED MICROSCOPE**
	Manufacturer's name/Country of origin:	Leica / Germany
	Product type, model:	Dmi8
	Head:**Binocular** 45º inclined, 360 º rotatable interpupillary distance range 55-70 mm or wider	Head:Binocular 45º inclined, 360 º rotatable interpupillary distance range 55-75 mm
	Includes objectives with below Achromatic Plan (AP), Phase Contrast (PC), NA Value (NA), Working Dimension (WD) or Free Working Distance (FWD) values; AP PC NA WD/FWD PH0 5x 0.12 min.9.9 mm PH1 10x 0.25 min.4.4 mm PH1 20x 0.35 min. 4.20 mm PH2 40x 0.50 min. 2.00 mm	Includes objectives with below Achromatic Plan (AP), Phase Contrast (PC), NA Value (NA), Free Working Distance (FWD) values; AP PC NA WD/FWD PH0 5x 0.12 14 mm PH1 10x 0.25 17.7 mm PH1 20x 0.35 6.9 mm PH2 40x 0.50 2.00 mm
	Condenser should have slide for phase contrast rings	Condenser has slide for phase contrast rings

1. Item Number	2. Specifications Required	3. Specifications Offered
	minimum 5 megapixels microscope camera connected to head of microscope shall be supplied with microscope	5 megapixels microscope camera connected to head of microscope will be supplied with microscope
	Camera interfaces(as minimum): One SD card, one HDMI, one S-video or RC2 and one USB interface	Camera interfaces: One SD card, one HDMI, one RC2 and one USB interface and remote control device
	Camera colour deepness: 24 bits (3x8 bits)	Camera colour deepness: 24 bits (3x8 bits)
	Camera should have picture shot and white balance buttons	Camera has remote for picture shot, video capture and white balance buttons
	Camera should include licensed, database software, view analysis software and measurement software to work with computer on at least MS Windows 8 or equivalent	Camera includes licensed, database software, view analysis software and measurement software to work with computer on MS Windows 8
	The software should be able to make Brightness, Contrast, Gamma, Color Balance, Saturasyon, Shading, Hue, Lightness, Sharpness, Orthoview, Shift, Smooth (View correction Gauss, Sigma) adjustments on the view taken by the camera	The software is able to make Brightness, Contrast, Gamma, Color Balance, Saturasyon, Shading, Hue, Lightness, Sharpness, Orthoview, Shift, Smooth (View correction Gauss, Sigma) adjustments on the view taken by the camera
3.50	**LAMINAR FLOW CABIN**	**LAMINAR FLOW CABIN**
	Manufacturer's name/Country of origin:	**NÜVE / Turkey**
	Product type, model:	**MN 120**
	Type: Class II according to EN12469:2000 or equivalent	Type: Class II according to EN12469:2008
	Internal dimensions: W:1200(+/- 100)mmx D:650(+/- 100)mmx H:700 (+/- 100) mm	Internal dimensions: W:1190 mm x D: 630 mm x H:630 mm
	Internal surfaces' structure: Produced from stainless steel	Internal surfaces' structure: Produced from stainless steel
	ULPA or HEPA filter with efficiency >99.999% (DOP) or >99.995% (MPPS EN 1822) for particle size between 0.1 to 0.3 microns or H14 HEPA EN 1822, 99.995% at the most penetrating particle size (MPPS).	HEPA filter with efficiency >99.999% (DOP) or >99.995% (MPPS EN 1822) for particle size between 0.1 to 0.3 microns
	Noise: 60 dBA or less	Noise: 60 dBA
	All cabinet functions shall be managed by a programmable microprocessor control system	All cabinet functions is managed by a programmable microprocessor control system
3.51	**LABORATORY CENTRIFUGE**	**LABORATORY CENTRIFUGE**
	Manufacturer's name/Country of origin:	**Hermle / Germany**
	Product type, model:	**Z 326K**
	Refrigerated desk- top centrifuge	Refrigerated desk- top centrifuge
	Speed range: 200 to 15000 rpm or wider range	Speed range: 200 to 18000 rpm
	Structure of the bunker: Made of stainless steel	Structure of the bunker: Made of stainless steel
	Motor type: induction drive	Motor type: induction drive
	Control: Microprocessor controlled for speed, duration and RCF setting, shall allow reading speed and remaining time	Control: Microprocessor controlled for speed, duration and RCF setting, shall allow reading speed and remaining time

1. Item Number	2. Specifications Required	3. Specifications Offered
	Duration setting: From 30 second to 10 hours or wider range	Duration setting: From 10 second to 99,9 hours
	The device shall include; a) fixed ended rotor for spinning min. 6 x 50 ml falcon tubes with min. 5000 rpm b) fixed ended rotor for spinning min. 6 x 15 ml centrifuge tubes with min. 4200 rpm c) rotor for spinning min.30 x 1.5 ml eppendorf tubes with min. 14000 rpm	The device includes; a) fixed ended rotor for spinning 6 x 50 ml falcon tubes with 6000 rpm b) fixed ended rotor for spinning 6 x 15 ml centrifuge tubes with 6000 rpm c) rotor for spinning 30 x 1.5 ml eppendorf tubes with 14000 rpm
	Screen type and function: LCD or LED, shows period, speed and RCF information	Screen type and function: LCD, shows period, speed and RCF information
3.52	**SONICATOR**	**SONICATOR**
	Manufacturer's name/Country of origin:	**Hielscher / Germany**
	Product type, model:	**UP 200 Ht**
	Ultrasonic homogenizer	Ultrasonic homogenizer
	Working volume range: 20 ml to 500 ml or wider range	Working volume range: 0,1 ml to 2000 ml
	Timer functionality: Programmable between 1 second to 99 minutes	Timer functionality: Programmable between 0,1 second to 99 days
	Shall include accessories for sonication inside the flow cell	It includes accessories for sonication inside the flow cell
	Shall include ultrasonic generator, probe, stand and handler	It includes ultrasonic generator, probe, stand and handler
	Minimum one probe shall be supplied with homogenizer to ensure capability for sample volume between 20 and 500 mm or wider range. If single probe does not cover the required volumes, more probes shall be offered..	One probe will be supplied with homogenizer to ensure capability for sample volume between 20 and 500 mm.
3.53	**INCUBATOR**	**INCUBATOR**
	Manufacturer's name/Country of origin:	**NÜVE / Turkey**
	Product type, model:	**EN 500**
	Temperature range: +5ºC ambient temperature to 80º adjustable	Temperature range: +5ºC ambient temperature to 80º adjustable
	Temperature sensitivity: max. 0.1ºC	Temperature sensitivity: 0.1ºC
	Volume: minimum 100 litres	Volume: 120 litres
	Shall have microprocessor PID control system	It has microprocessor PID control system
	Timer: 1 minute to 99 hours or wider range	Timer: 1 minute to 99,9 hours
	Quantity of shelves: minimum 2	Quantity of shelves: 2
3.54	**ORBITAL SHAKER-TYPE 2**	**ORBITAL SHAKER-TYPE 2**
	Manufacturer's name/Country of origin:	**GFL/Germany**
	Product type, model:	**3017**
	Shaking movement: Orbital	Shaking movement: Orbital
	Platform Dimensions (w*l) (minimum): 200 mm* 200 mm	Platform Dimensions (w*l): 450 mm* 450 mm
	Shall have microprocessor control	The device has microprocessor control
	Orbit distance: 15 mm or more	Orbit distance: 30 mm
	Shall have digital timer.	The device has digital timer.
	Max. loading capacity: 2 kg or more	Max. loading capacity: 15 kg

1. Item Number	2. Specifications Required	3. Specifications Offered
	Rotation speed range: adjustable up from 50 – 250 rpm or better range	Rotation speed range: 20 to 300 rpm
	Shall have an adjustable accessory to hold different types and sizes of flasks or bottles, minimum 4 Erlenmeyer flasks(250 ml)	The device has an adjustable accessory to hold different types and sizes of flasks, 12 Erlenmeyer flasks(250 ml)
3.55	**TEST TUBE SHAKER**	**TEST TUBE SHAKER**
	Manufacturer's name/Country of origin:	**Velp / Italy**
	Product type, model:	**Vortex Mixer Classic**
	vibrating mixer, vortex	vibrating mixer, vortex
	Rotation Speed Range: 200 to 2500 rpm or wider range, adjustable	Rotation Speed Range: 0 to 3000 rpm, adjustable
	Orbit diameter: minimum 4 mm	Orbit diameter: 4,5 mm
3.56	**CO_2 INCUBATOR**	**CO_2 INCUBATOR**
	Manufacturer's name/Country of origin:	**Nüve /Turkey**
	Product type, model:	**EC 160**
	Internal volume: min. 150 litre Quantity of Shelves:: 3 or more(standard)/ 6 or more (maximum)	Internal volume: 160 litre Quantity of Shelves:: 3 (standard)/ 8 (maximum)
	CO_2 calibration type: Automatic	CO_2 calibration type: Automatic
	Shall have microprocessor controller for temperature and CO_2 control, system control software shall be supplied with incubator. CO2 measurement/sensor shall be IR	It has microprocessor controller for temperature and CO_2 control, system control software will be supplied with incubator. CO2 measurement/sensor is IR
	Temperature range: ambient temperature +10 to 50°C or wider range adjustable with 0.1°C increments	Temperature range: ambient temperature +7 to 50°C adjustable with 0.1°C increments
	Temperature variation at 37°C : +/-0.3°C or better tolerance Temperature fluctuation at 37°C: +/-0.1°C or better tolerance Humidity average value at 37°C shall be %95 +/-%5 or better	Temperature variation at 37°C : +/-0.3°C Temperature fluctuation at 37°C: +/-0.1°C Humidity average value at 37°C is %95 +/-%5
	CO_2range: 0% to 20%, setting accuracy: 0.1 % CO_2	CO_2range: 0% to 20%, setting accuracy: 0.1 % CO_2
	Shall have LCD or LED display, RS 232 interface	It has LCD display, RS 232 interface
	carbon dioxide regulators shall be supplied with incubator	carbon dioxide regulators will be supplied with incubator
	Shall have alarm feature	It has alarm feature
3.57	**PLANT GROWING CABIN**	**PLANT GROWING CABIN**
	Manufacturer's name/Country of origin:	**İklimlab /Turkey**
	Product type, model:	**PRS U27 - 400**
	Shall be used for plant growing, climatization cabinet or tissue culture cultivation cabinet in laboratory conditions by creating different environmental settings.	It is used for plant growing, climatization cabinet or tissue culture cultivation cabinet in laboratory conditions by creating different environmental settings.
	Temperature range(Lights off): 2 to 40 º C or wider range	Temperature range(Lights off): 2 to 40 º C or wider range
	Temperature range(Lights on): 10 to 40 º C or wider range	Temperature range(Lights on): 10 to 40 º C or wider range
	Internal volume (Capacity): min. 400 lt	Internal volume (Capacity): min. 400 lt

1. Item Number	2. Specifications Required	3. Specifications Offered
	Shall have minimum 3-sided illumination. Total illumination shall be minimum 9.000 lux.	Shall have minimum 3-sided illumination. Total illumination shall be minimum 9.000 lux.
	Number of shelves: min. 4	Number of shelves: min. 4
	Humidity range: 60% to 80% or wider range.	Humidity range: 60% to 80% or wider range.
	Have microprocessor control system	Have microprocessor control system
	Shall have interfaces for external data transmission.	Shall have interfaces for external data transmission.
3.58	**AUTOCLAVE**	**AUTOCLAVE**
	Manufacturer's name/Country of origin:	**Nüve / Turkey**
	Product type, model:	**OT 90L**
	Type: vertical, floor standing, top loading steam steriliser	Type: vertical, floor standing, top loading steam steriliser
	Chamber volume: between 80-100 lt.	Chamber volume: 90 lt.
	Adjustable Temperature Range: from 115 ºC to 130 ºC or wider range. Shall have timer feature	Adjustable Temperature Range: from 105 ºC to 136 ºC. It has timer feature
	have LCD(or LED) display and microprocessor control. Shall have internal memory for storing sterilization programs. Shall have interfaces for external data transmission.	It has LCD display and microprocessor control. It has internal memory for storing sterilization programs. It has interfaces for external data transmission.
	Safety: Should have pressure safety mechanism	Safety: It has pressure safety mechanism
	Housing, support frame and pressure vessel made of corrosion-resistant stainless steel	Housing, support frame and pressure vessel made of corrosion-resistant stainless steel
	Should be submitted with 2 stainless steel baskets	It is submitted with 2 stainless steel baskets
3.59	**MICROLITRE CENTRIFUGE**	**MICROLITRE CENTRIFUGE**
	Manufacturer's name/Country of origin:	**Hermle / Germany**
	Product type, model:	**Z 216 MK**
	Microlitre centrifuge, refrigerated	Microlitre centrifuge, refrigerated
	Motor type: Brushless motor drive	Motor type: Brushless motor drive
	Screen type and functionality: LCD or LED, displays running time, speed and RCF	Screen type and functionality: LCD, displays running time, speed and RCF
	24 x 1.5 mL angle rotor shall be supplied with equipment	24 x 1.5 mL angle rotor will be supplied with equipment
	Speed setting: 250 to 15000 rpm or wider range	Speed setting: 250 to 15000 rpm
	Max RCF: 15000 xg or more	Max RCF: 21380 xg
	noise level: 60 dBA or less	noise level: 56 dBA
3.60	**DEEPFREEZE TYPE 2**	**DEEPFREEZE TYPE 2**
	Manufacturer's name/Country of origin:	**Simfer / Turkey**
	Product type, model:	CS4340 A++
	volume: min. 300 litre	volume: 301 litre
	Shall include min. 2 baskets	It includes 2 baskets
	Shall include internal lighting	It includes internal lighting
	Type: Horizontal	Type: Horizontal
	Type: commercial use	Type: commercial use
	Freezing capacity: Between -9ºC to -15 ºC or **wider range**	Freezing capacity: Between +4ºC to -24 ºC
	Energy class:A++	Energy class:A++
3.61	**STEREO MICROSCOPE**	**STEREO MICROSCOPE**
	Manufacturer's name/Country of origin:	**Carl Zeiss / Germany**

1. Item Number	2. Specifications Required	3. Specifications Offered
	Product type, model:	**Stereo Discovery V8**
	Head: Trinocular, 45ºC inclined, 360º rotatable with diopter adjustment range with minimum +/- 4.5 mm	Head: Trinocular, 45ºC inclined, 360º rotatable with diopter adjustment range with +/- 5 mm
	Interpupillary distance:55-70 mm or wider range	Interpupillary distance:55-75 mm
	Light source: LED	Light source: LED
	Video and camera connection: On oculars	Video and camera connection: On oculars
	Magnification range : 7x to 45x or wider range	Magnification range : 6,3x to 50,8x

SONUÇ

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Türkiye Cumhuriyeti
Bilim, Sanayi ve Teknoloji Bakanlığı