Item # B 1 as per PPRA rule 36(d), C&F Basis

Item #1

Multi-component Melt Spinning Equipment along with melt blender (Lab-cum-pilot-scale)

The specifications are as under:

Basic specifications	
Materials	Thermoplastic materials (including Polyvinylidene fluoride - trifluoroethylene copolymer)
Yarn type	Fully drawn yarn (FDY), Partially oriented yarn (POY)
Number of filaments	Monofilament, Multifilament
Number of components in filament	Mono-component, bi-component, tri-component
Filament cross-section	Round, multi-lobal (0.1 to 1.0 mm diameter)
Temperature range	Up to 450°C
Multi-component filament configurations (die types)	Core-sheath filament, islands in sea filament, side by side filament
Controlling	Fully integrated computer controlled
Configuration	Easy to open, access and clean all parts which are in contact with material
Screw designs	Modular design (configured according to customized application)
Screw configuration software support	Yes
Venting and feeding points	Customized according to screw configuration
Throughput (continuous max.)	0.1 - 6.0 kg/hr
Heating zones	5 / 4
Pellet size	Industrial grade size
Additive dosing option	In liquid form, powder form and pellet form
Attached assemblies	Cooling system, Haul-off system, spin finish application, Orientation oven, Take-up winder, Polymer drying system, Die-cleaning system and spin-pack preparation
Auxiliary devices	Any device which is required for operational working and control of machine and its parts

Dr. Ali Afzal

17/10/2018

Item # B 2 as per PPRA rule 36(d), FOR Basis

Item #2

Non-Contact Portable Spectrophotometer

The specifications are as under:

Geometry:	45/0° dual illumination
Illumination:	Full spectrum LED
Spectral Engine:	True Dual beam, 31 channel
Spectral Range:	400 - 700 nm
Spectral Interval:	10 nm measured, 10 nm output
Measurement Range:	0-150% reflectance
Calibration Interval:	Once per week or temperature shift > 14° C (25.2° F) (self detected)
Measurement Spot Size:	6 mm (1/4") and 12 mm (1/2")
Measurement Distance:	38 mm (1 1/2") nominal lens to measurement surface
Repeatability:	6 mm 0.035 ΔEab Maximum 12 mm 0.025 ΔEab Maximum (white ceramic tile)
Inter-instrument Agreement:	6 mm 0.15 avg ΔEab (12 BCRA tiles) 12 mm 0.15 avg ΔEab (12BCRA tiles)
Gloss Geometry:	45/0°, 60° Correlated
Gloss Repeatability:	0-10 GU, +/- 0.2 GU, 10-100 GU, +/- 0.6 GU
Gloss Reproducibility:	5-92 GU, 3.0 GU maximum, 1.5 GU average
Operating Temp:	10° - 40°C (50° - 104°F)
Humidity:	0-85% relative non-condensing

16/10/18

Dr. Ali Afzal

Item # B 3 as per PPRA rule 36(d), C&F Basis and Item # B 4 and 5 as per PPRA rule 36(d), FOR Basis

Item No.	Equipment	Initial Specifications
3	Beam to Beam Sizing Machine (Pilot Scale)	Yarn to be sized: Cotton, PC, Multi filament yarns Creel capacity: 4 working width: 2000 mm Size Box Temperature:40-100 C Squeeze Pressure:10 kN Size Box Volume:70 L Drying Cylinders: 4 or higher Drying Temp. :40-120 C Sizing Speed: 2-15 Meter/Min Fully automatic with sensors for temperature, humidity etc. PC controlled Includes all accessories required for functioning
4	Terry towel loom (Pilot Scale)	Yarn to be weaved: Cotton, PC, Multi filament yarns Working width: 500 mm or higher Dobby shedding Frames: 16 or higher Weft: 4 color or higher Leno selvedge Rapier weft insertion Fully automatic PC controlled Includes all accessories required for functioning No. of beams: 4 (2 on loom+ 2 spare)
5	Water jet weaving machine	Yarn to be weaved: Multi filament yarns of polyester, Nylon, Kevlar etc. Woking width ~~more than~~ 600 mm or more Equipped with 6-10 frames Tappet/Dobby shedding system Weft: 4 color or higher Leno selvedge Fully automatic PC controlled Includes all accessories required for functioning

Zubair 06/1/16

Item # B 6 as per PPRA rule 36(d), C&F Basis

Item # 06 Warp-Weft hybrid Flat knitting machine

Specification	Description
Bed Length	36" to 40 "
Gauge	10 E to 16 E
Tyarn carrier	Capability of Intarsia
Carriage	Equiped with cam system and second stitch cam.
Techniques	Racking, Loop transfer, Stitch presser and Sinker system
Attachments	Computer system with latest design software, Warp yarn creel, Safety devices,
End Products	Number of colored yarn hybrid structures, Vertical stripe knitted fabrics and Self turning garments etc.

1. Dr. Hafsa Jamshaid

2. Mr. Jamal Akbar

3. Mr. Sikander Abbas Basra

Item # B 7 as per PPRA rule 36(d), FOR Basis

Ultrafine Gauge Glove Knitting Machine

Specifications:

	Specifications
Type	Seamless glove knitting machine with software having ability to knit irregular shapes
Gauge	8 to 15
Size	Large, Medium
Feeders	1-3
Knitting System	Sinker knitting
Average width	4-8''
Speed range	Finger (50 -210), Palm (25-110)
Drive	Inverter motor crank system
Options	Size changing device, plaiting yarn feeder, 2 colour and 3 colour conversion device, 6 colour knotter device, High performance fibre device,
Techniques	Stitch transfer system, open finger formation system, control panel
End product	Protective gloves, open finger gloves, colour stripe gloves, irregular shape knitted products like gloves and socks

1. Dr. Hafsa Jamshaid
2. Mr. Jamal Akbar
3. Mr. Usman Ahmed

Item # B 8, 9, 10 and 11 as per PPRA rule 36(d), FOR Basis

Textile Processing Department

Initial Machine Specifications

No.	Machine	Machine Specifications
8	Soft Yarn Winder for Dyeing	Precision package winder Suitable for all kind of staple and filament yarns for package dyeing
9	Woven Fabric Jigger dyeing Machine	A sample jigger for dyeing up to 20 meters of fabric at atmospheric conditions. • Adjustable fabric tension • Fabric speed up to 10m/min • Electrical heating with rate of rise and top temperature control.
10	Denim Warp Dyeing (Sky Padder)	Process speed indication. Display resolution 0.1m/min. • Dye Tank Temperature indication and control. • Temperature control and calibration • Low deflection of padder bowls • Vertical 'rubber on stainless steel' bowl configuration
11	Digital Inkjet fabric printing machine	Printing width upto 500cm, 2400 DPI Fabric weight upto 300 gr/sqm (no stretchable fabrics and no trough print)

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Item # B 12, 13, 14 and 15 as per PPRA rule 36(d), FOR Basis

Item No.	Equipment	Initial Specifications
12	Composite Sample Cutter (Metal)	Cutter for precise cutting of carbon fiber composites, FMLs, polymers etc. Variable speed Circular blade dia: 3-6" Screw holder Digital RPM indicator Splash guard, Metal blades (set of three)
13	Laboratory density meter	For solids like carbon fiber composites, FMLs, polymers etc. Measuring range Density 0 to 10 g/cm^3 Accuracy: 0.00005 g/cm^3 Temperature 0 to 90 °C ± 0.03 Minimum sample size. 1 g or higher
14	Tribotester	Lab scale equipment Friction: dry or lubricated Standard loads: Force Range: 20N (60 N with extra weights) Friction Force Resolution: 0.06mN Rotating speed: 0.2 to 2000 rpm Maximum torque: 450mN Temperature Sensor Range: -40 to 125°C Temperature Sensor Resolution:0.015°C Humidity Sensor Range: 0 to 100% RH Tribometer Frame: - Elastic arm measuring max 20 N friction force - 2 friction force sensors to overcome thermal drift error - Integrated temperature and humidity sensors - DC Motor providing max 2000 rpm rotation speed - Carriage with graduated guide and adjustment knob - Plexiglas top cover providing enclosed testing environment and acoustic noise reduction - Electronic control unit
15	3 Roll mills machine	For dispersion of fillers in polymers/resin Roller Material: Stainless Steel or Ceramic Diameter of Roller: 2.0" or higher Length of Roller 4.0" or higher Roller Speed Ratio: 1:2:4 RPM of Slow Roller 0~100 or more RPM of Mid Roller 0~200 or more RPM of Fast Roller 0~400 or more

Item # B 16 and 17 as per PPRA rule 36(d), FOR Basis

16	Pre-preg line	For prepreg formation for fiber reinforced thermosetting polymers Materials: carbon/epoxy, glass/polyester etc. Creel capacity: 300 or higher Max Width of Prepreg: up to 800 mm or higher Process speed: 0 - 5 m/min or higher Process Temperature: 40 -250 °C Heating Media: Thermal Oil or similar Cooling Media: Water or similar Includes all accessories required for functioning
17	Split Hopkinson pressure bar	For measurement of dynamic stress-strain behaviour of composite samples The diameter of the projectile and input and output bars in the range 16-32 mm. Length of the projectile is 1500 mm or higher, Maximum pulse length: 60 ms or higher High-pressure chamber with capacity to accelerate a projectile with a diameter of 30-34 mm up to an impact velocity of 18-24 m/s.

Item # B 18 as per PPRA rule 36(d), FOR Basis

Item No.	Equipment	Initial Specifications
18	Extruder	Lab scale Materials: Polyolefins/elastomers Type: Twin screw Screw speed: 0-100 rpm or higher capacity: 100 grams to 5.0 Kg Temperature: room temperature – 300 °C or higher

Item # B 19, 20, 21, 22, 23 and 24 as per PPRA rule 36(d), FOR Basis

Item No.	Equipment	Initial Specifications
19	Composite hardness tester	Materials: Polymers, Carbon/epoxy, Glass/polyester composites etc. Minor load: 10 kgf or lower Major load: 60 Kgf/100 Kgf/150 Kgf or similar Force application: dead weight Force control: Hydraulic dashpot Vertical capacity: 6 inch or higher Throat depth: 6.0 or higher Analog/digital result display
20	LVDT for displacement measurements	For measurement of displacement of thermosetting polymers when subjected to controlled temperature and pressure Materials form: Liquid/Solid Electromechanical type Precision: 0.001 mm Measurement range: 1 micron to 1 cm or higher Sample size: 1 - 10 gram
21	Stable Temperature Ceramic Hot Plate	For controlled heating of liquids/solids Temp range: 30 to 500°C or higher Top plate material: Ceramic Power (Amps) 4-6 Power (watts) 1000-2000
22	Digital Dual-Range Mixer	Suitable for a variety of mixing applications Four-blade propeller, stand, clamps Digital display Possibility of adjustment for impeller depth Maintenance-free motor rated for continuous duty Min speed (rpm) 100 or lower Max speed (rpm) 1800 or higher Viscosity (cp) range: 8000-12,000 Control using touch panel
23	Micro-sieve	For filtration of particles/microcapsules Membrane Size range: 1 to 150 mm, Membrane Thickness: 0.1 to 5 µm Pore Size range: 0.1 to 100 µm Membrane Material: Ceramic or equivalent Temperature Resistance: -50 to 700°C Inert to organic solvents
24	Ultra-tube disperser	Disperse, stir, homogenize and grind using a single drive unit Hermetically sealable disposable sample tubes Anti-locking function Chemical-resistant plastic Adjustable speed and test duration Max sample size (mL) 50 Speed (rpm) 400-6000

Item # B 25 to 43 as per PPRA rule 36(d), FOR Basis

Broad specifications of garment manufacturing equipment

Sr. No.	Equipment	Broad Specifications
25	Single needle Lock stitch machine (2)	High speed machine, with auto trimmer, complete with motor, stand and table
26	Double needle lock stitch machine	2 needle 4 thread, split bar, high speed, complete with motor, stand and table
27	Over lock machine	2 needle 5 thread, high speed machine, complete with motor, stand and table
28	Chain Stitch sewing machine (Feedo)	2 needle 4 thread, with feed of the arm machine bed, high speed, complete with motor, stand and table
29	Bartack sewing machine	Single needle 2 thread, computerized, complete with motor, stand and table
30	Button attachment machine	Single needle 2 thread, computerized, complete with motor, stand and table
31	Buttonhole machine	Single needle 2 thread, computerized, complete with motor, stand and table
32	Ring /eyelet machine	Complete with magazine, motor, stand and table
33	Automatic pattern sewing machine	Lockstitch machine, having capability to stich different patterns
34	Elastic Attaching machine	4 needle 8 thread elastic attaching machine complete with motor, stand and table
35	Post bed lock stitch machine	1 needle 2 thread, post bed with motor, stand and table
36	Ultrasonic sewing machine	Two differentiable drives for sonotrode and anvil roll, Welding procedure: 35 kHz, 400 W ultrasonic generator with rotating 7mm steel sonotrode or 10 mm titan sonotrode
37	Sample Embroidery Machine	Single-head embroidery; number of needles 15-20; speed > 100 spm
38	Buck pressing machine	Pneumatic, computerized steam pressing machine. Buck working length > 50 inches
39	Fabric label printer (Multi colour)	Label printing area = 2" X 5", Double sided printing, both coated and satin fabrics, adhesive labels and size stickers, heat seal labels, complete with all software
40	Digital Heat press machine	Adjustable time, temperature and pressure settings, 16 x 20 inches Platen size.
41	Folders and Attachments	Folders of different gauges and machine attachments for different machines
42	Digital thickness gauge tester (Seam thickness)	Thickness measurement 0.01 - 50 mm, with PC controller and software
43	Newton thermal manikin system	34 zone configuration, Asian male body, with removable sweating skin, PC, data acquisition system and software

16-10-18

Dr. Abher Rasheed

Dr. M Babar Ramzan

Muntaha Rafique

Mariam Jabbar

Item # B 44, 46, 47 and 49 as per PPRA rule 36(d), FOR Basis and Item # B 45 as per PPRA Rule 36(d), C&F Basis

44	Fabric Wrinkle Recovery Tester	For AATCC 128-2009 & ISO 9867 For Fabric made from all types of fabric Variable weights for test Standard Chart for comparison
45	Favimat+ROBOT2; Fully Automatic	Measurement of linear density with the vibration method; Static tensile test, cyclic load testing, creep- and relaxation trials Continuously adjustable gauge length measuring range up to 220 cN, Linear-density measuring system
46	Dynafil ME+-Universal filament yarn tester	Pre-selectable extension Gauge length between the godets upto 1000 mm; Electrically heated, Automatic traversing for yarn introduction to the heater Two easily exchangeable load cells
47	STATIMAT ME+; High tenacity yarn tensile tester	Pneumatic yarn clamps Automatic linear threading, Min. gauge length 50 mm, Draw-off clamp speed 1 - 5000 mm/min. Force-measuring device with easily exchangeable force transducers.
49	Water bath (3)	(to be maintained 45-50C)

Dr Sheraz Ahmad (Convener)

Dr M. Ali Afzal

Mr. Khurram Shehzad Akhtar

Item # B 48 as per PPRA rule 36(d), FOR Basis

Item No.	Equipment	Initial Specifications
48	Cone Calorimeter	Required standards: ASTM E 1354 ASTM E 1550 ASTM E 1740 ASTM D 5485 ASTM D 6113 NFPA 271 NFPA 264 CAN ULC 135 BS 476 part 15 ISO 5660 Parts 1 and 2. High accuracy weigh cell with 0.01g resolution; 5000w inconel tubular heaterPID temperature control; Spark igniter Computerized automated setting of heat flux level; Smoke measuring system - helium-neon laser light source - computerized calibration and scaling Gas sampling and analysis system CO_2 analyzer - non-dispersive infra-red - 0-10% range (v/v) CO_2 analyzer - 0-1.0% range (v/v)

Item # B 50 as per PPRA rule 36(d), FOR Basis

Item 50. Multiaxial Weaving Machine

Specification

• For weaving 3D multilayer fabrics
• Reed width: upto 1300 mm
• Yarn type: Tow/flat yarn (Carbon, Kevlar, Glass etc.)
• Fabric weight: 500~5000 g/m^2
• Fabric thickness: 1~20 mm
• Number of layers: upto 20
• Picking system: Rigid rapier picking
• Shedding system: Single Harness controlled Jacquard (2ooo hooks or higher)
• Weft selection: 4 or higher
• Yarn tex: 200~2000 tex
• Speed: 50~200 picks per min or higher.
• Creel capacity: 2000 or higher
• Selvedge: Leno/Tuck-in
• Thermal cutters for high performance yarns
• Power back up for emergency shut down in safe mode
• Real time data acquisition / analysis system (fixed)
• All parts / accessories required to make machine operational on site

Item # B 51 as per PPRA rule 36(d), FOR Basis

Item # 51 - Laboratory Compressor

Detailed Specifications

- Low noise
- Input Voltage - Air Compressor 120VAC
- Enclosed - Air Compressor Yes
- Tank Size - Air Compressor 10 gal.
- Free Air CFM @ 90 PSI - Air Compressor 3.40
- Item - Air Compressor Laboratory Air Compressor
- Lubrication Type - Air compressor Oil Free
- Max. Pressure - Air Compressor 120 psi
- Free Air CFM @ Max. Pressure - Air Compressor 3.00
- Phase - Electrical 1
- Tank Style - Air Compressor Horizontal
- Pump Type - Air Compressor Rocking Piston
- Amps 16.0
- ASME Tank Yes
- (F)NPT Outlet 1/4"
- Duty Cycle Continuous
- RPM 1650
- Thermal Protection Yes
- Finish Powder Coated Tank/Nickel Plated Brass Fittings/Painted Frame
- Enclosure Yes
- Motor Type AC-IP20 Rating
- Overall Length 26"
- Overall Width 25-1/2"
- Overall Height 34"
- Includes Desiccant Dryer, Waste Collection Bottle
- Item Electric Air Compressor

Convener:

Member:

Member:

Member:

For Shahzad.

Item # B 52 as per PPRA rule 36(d), C&F Basis

(Item # 52)

Pilot scale Nitrogen Dyeing Machine

Cylinder volume (L) = 550-600

Cylinder diameter =1300-1350mm

Cylinder depth = 500-520mm

Speed = 0-200 rpm

Power = 7-8 KW

Controlled Nitrogen, dyestuff and chemical dosage

16/10/18

Note: Any confusion may be discussed