



Birla Institute of Technology & Science, Pilani

K K Birla Goa Campus

Purchase Division

REQUEST FOR QUOTATION

GSTIN:30AAATB2599R1ZC

Enquiry No: BPGC/BITSBiocity/Inquiry/2023-24 /001

Date: 19/07/2023

BITS PILANI K.K. BIRLA GOA CAMPUS invites quotations for the supply of below mentioned item.

Sr. No.	Description of Items
1.	Construction of Class 10,000 and Class 100,000 Clean room with Air Handling Unit, HVAC, Gowning Area and Air Curtain Technical Specification is attached as Annexure-A

Terms and conditions:

1. Quotation must be valid for at least 90 days.
2. The GSTIN should invariably be mentioned in your offer.
3. Kindly attach a GST certificate and PAN card copy along with the quote.
4. Prices:
 - i. In case of multiple options of same product, bidders are requested to quote only one best option and not multiple options.
 - ii. Payment terms: Within 30 days after the delivery and installation of the item at BITS Pilani K. K. Birla Goa Campus.
5. Delivery and installation should be made within **xxxxxx** of getting a confirmed order.
6. The suppliers shall provide the banking details along with their quote on their letterhead duly signed and stamped.
7. Quotations shall be submitted as below;

Quotation should contain all the technical details and specification of the product. It should contain price along with terms and conditions, compliance certificates, proprietary certificates (if applicable), any other certificates/details etc. Quotation should have file name as: inquiry_2022_vendorname.doc in word format.
8. For any clarification, you may kindly contact (email: procurement@goa.bits-pilani.ac.in) till **xx/xx**/2023.
9. All quotations must reach to the Purchase Manager, BITS PILANI K.K. BIRLA GOA CAMPUS, 403 726 by 17.00 Hrson or before **xx/xx**/2023.

Purchase Office



Birla Institute of Technology & Science, Pilani

K K Birla Goa Campus, NH 17B,

Web: www.bits-goa.ac.in



TECHNICAL SPECIFICATION for construction of Class 10,000 and Class 100,000 Clean Room

Description: Bid for Construction of Class 10,000 and Class 100,000 Clean room with Air Handling Unit, HVAC, Gowning Area and Air Curtain.

Basic information	
Location	BITS Pilani, Goa Campus
Floor	First floor
Area of class 10,000 (approx.)	1020 Sq.Ft
Area of class 100,000 (approx.)	150 Sq.Ft
Clean Room Ceiling Height	9 ft.
Maximum number of persons to work in CR	8
Thermal Load in Class 10000 Area (max.)	10 kW
Temperature to be maintained	22°C +/- 3°C
Rel. Humidity	45 +/- 5
Air Pressure (Change Room)	10 pascal
Air Pressure (Air Lock)	15 pascal
Air Pressure (Clean Room)	20 pascal

Note 1: The contractor may opt for any higher overall thickness at his own cost. Nothing extra over the quoted rate/ work order rate shall be paid for any extra thickness over & above minimum stipulated thickness.

Note 2: Vendor may visit the site before submitting their bids. Please submit order quantity after visit and discussion with User Team as listed below.

Note 3: Vendor to specify type of flooring required for Epoxy floor paint before beginning of project execution. The flooring will be done before the project execution begins.

Note 4: The Bidder should submit a separate Compliance Document which indicates a deviation from specifications and a technical reason for the same.

Note 5: The bidder can recommend with valid technical justification the capacities of AHU and Condensing units to achieve the desired particle class and temperature control in the clean room and the gowning area.





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Item No.	Description of Item	Unit	Qty.
A	CLEANROOM INTERIORS:-		
1	Clean Room Wall panels		
1.1	Supply and installation of Wall Panel progressive type of 80 mm thick with double skin demountable panel made of minimum of 0.8 mm thick PCGI Sheet on both side with Puff infill of 40+/-2Kg/M ³ density. Locking system is GI Profile with GI Wall inserter systems with necessary accessories along with sealant for seamless and airtight finish. Color shall be RAL 9002 (glossy)	Sq. ft.	
1.2	Supply and installation of riser GI Profile with GI Wall inserter systems with necessary accessories along with food grade sealant for seamless and Airtight finish (with inbuilt return ducts using GI. Color - RAL9002 glossy). Inbuilt return Air Riser Duct in the Panels along with perforated Detachable SS Grill, Volume Control Damper & Pre-filter EU 5	Sq. ft.	
1.3	Supply and installation of walkable Ceiling Panel 50 mm double skin demountable panel made of 0.6 mm thick PCGISheet on both side with Puff infill of 40+/-2Kg/M ³ density locking system is GI Profile with GI Wall inserter systems with necessary accessories along with sealant for seamless and Airtight finish. Color - RAL9002 (glossy)	Sq. ft.	
2	Panel accessories		
2.1	Supply and installation of aluminium Coving of radius 50 mm with Aluminum Backing (Wall to Wall, Wall to Ceiling, Wall to Floor).	Feet	
2.2	Supply and installation of Al Powder coated 2D/ 3D corner	Nos	
3	Clean Room Doors		
	Supply and installation of galvanized Iron Powder Coated double skin door with 44 mm leaf thickness made of 1 mm GI sheet for door leaf with PUF of density 40 Kg /M ³ infill and door frame made out of 1.60 mm thick GI profile/ aluminium powder coated frame for 50 mm panel. ACCESSORIES: SS 304 ball bearing Hinges, SS304 D handle, Dead Lock with Both side key operation SS Kick plate 0.8 mm thick upto 300 mm height Door closer TS 68 Standard Arm Dorma Make, Concealed type Bottom Drop seal. Door stopper floor mounted Apar make, Double glazed view panel of 400*800 mm with 5 mm thick toughened glass, Door seal, Concealed type flush bolt for Double leaf door		
3.1	Double door : 1500 x 2100	Nos	
3.2	Single door Size: ~1000 x 2100	Nos	
3.3	Supply and installation, sizing & fixing in position 900 mm x 2100 mm Single leaf Air tight Emergency doors pre-approved make 40 mm thick flush doors made of 1 mm thick GI totally flush with the wall panels sheet with PUF as infill and concealed hardware including providing & fixing door frame, precise cutting of shutters for aligning, positioning in proper line, level & plumb including providing & fixing all required hardware for fixing of door frames & shutters, double glazed hermetically sealed view panel with minimum 5 mm thick tempered toughened glass, 16 swg kick plate from push side, SS push plate, TS 68 standard arm - Dorma make premium door closure, SS D handle generally of 250 mm length and 25mm dia, Specially fabricated Heavy		





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	Duty SS Ball bearing hinges 3 nos, Auto drop door seal, Door set lock with 1 side key 1 side knob, Panic bar - Panic bar with single point locking arrangement from outside concealed tower bolt as required etc all complete as per detailed specifications, standard operating procedures.		
	Emergency door with panic bar, installed on Double Door	Nos	
3.4	Supply and installation of double glazed flushed view panel using Toughened Glass of 5 mm thickness		
	Glass Window Panel Size 900*900 mm or 900*1200 as per design	Nos	
4	Cleanroom Light		
	Supply and installation of Tear Drop/Recess Cleanroom compatible LED light 40W temperature of Yellow light 3500K -4500K and 400-500 lux.in YELLOW ROOM One Lamp with UPS Emergency Backup (UPS not in your Scope)	Nos	
	LED White light 40W in Clean Room 3 Lamps with UPS Emergency Backup (UPS not in your Scope) 6000K-7000K	Nos	
5	Terminal Box with HEPA filter (2'X2') and damper		
	Supply and installation of Terminal HEPA Module, Flange Type with Filter Room Side Change with the Below Features : * MOC of Housing: GI * MOC of Filter: Aluminum Anodized Extrusion * Top Air Inlet * With Internal Air Distribution Perforated Diffuser plate * With Upstream PAO concentration port & pressure measurement ports, * Worm Gear Operated Damper at external to the housing * Supplied with RTV Gasket Seal HEPA Filter Box Type, * Filter Media: Glass Fiber Media with Hot Melt Separator, with P/C GI Face Guard on both side * Class : EU13, Efficiency: 99.995% @ MPPS, as per EN1822(99.999% @ 0.3 Micron) * With 18G, SS304 Perforation Sheet ULFA Filter Size: 610 x 610 x 150 mm CFM: 500 +/-10% @0.45 m/s Velocity: IPD : 135 Pa +/-10%, FPD:500 Pa EU 13 Filter – This should achieve and maintain CLASS 10000.		
	Flow 500 +/- 10% CFM at 130 FPM	Nos.	
6	Return air SET		
a	Return air Riser Filter	Nos.	
	450X450X25 mm (or as per design to achieve and maintain CLASS 10000)		
b	Return air RISER DAMPER	Nos.	
	590 X 90/70 mm (or as per design to achieve and maintain CLASS 10000)		
c	Return air RISER PERFORATED SHEET	Nos.	
	510 x 510 x 1.6 mm SS304 (or as per design to achieve and maintain CLASS 10000)		
7	Terminal Box with HEPA filter and damper for 40% area coverage in Class 10000 room	Nos.	
	HEPA filters of size 610 x 610 mm for 90 FPM velocity		
	Aluminium T-Grid for installation of filters in Clean Room	Nos.	





8	Air Shower (1 Persons) Size 1200 x 1200 x 2400 mm		
	Supply, installation, testing commissioning of Air shower for Dust proof entry of the persons in the Clean Room, Fabricated with 18G MS powder coated. (having Sufficient jetnozzles, Blower Motor, Pre-filter, Hepa Filter, Return air perforated grills, Lamps, Door interlocking system) space for 1 people entry at a time with showering duration of 30sec with nozzle speed of 20- 25 m/s.	Nos.	
9	Garments Storage Cabinet 1200 x 450 x 1500 mm		
	Supply, installation, testing commissioning of Cleanroom Garments Storage Cabinet, Fabricated with 18G GI powder coated. (Blower Motor, Pre-filter, Hepa Filter, Return air perforated grills, Lamps, Shelf, Hanger, IR Lamp, Magnehelic Gauge)	Nos.	
10	Cross Over Bench cum shoe rack		
	Supply, installation, testing commissioning of cross overbench 1200 x 450 x 500 mm MOC IS 304 Grade Stainless Steel	Nos.	
11	Cleanroom Mirror - 1800 x 600 x 5 mm	Nos.	
12	PASS BOX		
	Supply Installation of Static Pass box MOC SS-304 finish with velocity of 90 FPM as per dimension below.		
a	Static 600 x 600 x 600 (L x W X H)	Nos.	
13	FLOOR		
a	Providing, laying, 3 mm thick anti-static, self-leveling ESDEpoxy coating on floor etc. as per manufacturer's recommendations, standard operating procedures. Colour to be specified and selected later by user.	m ²	
b	Epoxy coving (50R)	RMT	
14	Air curtain - 900 mm wide		
a	Supply, Installation, Testing and Commissioning of Air curtain with outer cabinet shall be of suitable gauge of CRCAsheet & epoxy powder coated. Motor shall be of single phase, 1440 RPM, Grills / louvers shall be made of powder coated mild steel. Support, Door Limit switch & necessary interlocking cabling shall be included in the scope.	Nos.	
B HVAC HIGH SIDE EQUIPMENT			
15	Floor mounted AHU (The Capacity and number of AHU's should be decided and proposed to achieve the desired CLASS 10000 in the Clean Room)		
15.1	AIR HANDLING UNIT: SP 125 MMWG(PCR,PC, PREPARATION,A/L-1,2,PACKING) (RECIRCULATION UNIT) BODY: Double Skin AIR HANDLING UNIT Comprising of Framework Assembled Out of Extruded Aluminium Thermal Break Profiles and Peralumin Nylon Glass, Fibre Reinforced Corner Joints Having Double Skin Sandwich Panels Injected with PUF 43 mm, Panel inner sheet GI 0.6 mm and outer sheet 0.6 mm Pre Painted GI .Limit switch, Marine light, FILTERS WITH FILTER SECTION. Pre FilterEU-4: Flange type, Al		





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	const., Washable HDPE, 90% down to 10µ With Mixing. Fine filter [EU-5]: AHU mounted, Flange type, AL construction, to remove particles down to 5 Microns with an efficiency of 95 %. Fresh Air filter [EU-4]: AHU mounted, Flange type, AL construction, to remove particles down to 10 Microns with an efficiency of 90 %. PLUG FAN Make: Nicotra / Rosenberg MOTOR (7.5 HP) Make: Crompton, /Bharat Bijali /compatible. Type: TEFC, IP: 55, Foot Mounted, Poles: 2 or 4/RPM: 1440/2800, Volts: 3Ø, 415, Mounting: Heavy duty channels, motor should move on both axis [X & Y]. DX COIL. Casing: G.I. sheet /MOC Tube: 0.4mm thick, 12.5mm dia, Copper, Hydraulically tested at 250psi./MOC Fins: 0.16 mm thick, Aluminum, 12 fins/inch properly bonded with tube/Face Velocity: @500FPM/Row Deep-Six. VOLUME CONTROL DAMPERS. Type: Box, aerofoil profile opposed blade, gear driven, Low Leakage/MOC: 18 swg Extruded Aluminum./Other: Marked for Open & Closed./Location-AHU supply, Return, Fresh air, Bleed-Off MAGNEHELIC GAUGE 0-25 FOR PRE FILTER 0-50 FOR FINE FILTER U-BEND		
a	AHU-1: 10000 cfm @ 125mm WC SP (RECIRCULATION UNIT) for Class 10,000 room The Capacity to be decided by Designer.	Nos.	
b	AHU-2: 1400 cfm @ 125mm WC SP (RECIRCULATION UNIT) for Class 100,000 room The Capacity to be decided by Designer.	Nos.	
15.2	Air cooled Condensing Units including Ecofriendly gas (The Bidder to recommend Capacity and quantity of units to achieve the temperature in the Clean room). Foundation and vibration isolation mounting of AHU is in bidder's scope.		
a	11.5 TR Nominal capacity Air cooled condensing unit with single compressor The Capacity to be decided by Designer.	Nos.	
b	5.5 TR Nominal capacity Air cooled condensing unit with single compressor The Capacity to be decided by Designer.	Nos.	
d	Refrigerant copper piping with insulation leak detection (suction, liquid line and insulation together in a group)	Rmt	
15.3	Supply, installation, testing and commissioning of miscellaneous components:		
a	Refrigerant pipe fittings, expansion valve, strainer required for each condensing unit	Lot	
b	Thermostat with Humidistat	Nos.	
c	Control wiring for thermostat and humidistat	Lot	
15.4	Variable frequency drives independently with bypass starter panel and also differential pressure near with cabling from the sensor located on the duct to the VFD for air handling units / exhaust fan of following capacity motors including necessary fittings and fixing accessories etc. complete		
a	For AHU-1: 10000 cfm @ 125mm WC SP (RECIRCULATION UNIT) The Capacity to be decided by Designer.	Nos.	
b	For AHU-2: 1400 cfm @ 125mm WC SP (RECIRCULATION UNIT) The Capacity to be decided by Designer.	Nos.	
c	Differential Pressure (DP) sensor	Nos.	





d	Magnehelic gauges with GI box with SS cover plate and sensors with necessary tubing for filters across AHUs and exhaust	Nos.	
16	AHU Upgradable with an ADD ON Unit of Pan De-humidifier with pre cooling coil and heater	Nos.	
	<p>DHU will be double skin 43mm thick puff insulation & density of 40+/- 2 kg/m³. The inner skin 24 gauge pre coated sheet & external is pre coated 22 gauge G.I sheet.</p> <p>Supply air section shall comprise of :</p> <p>Inlet Fresh Air-filter EU-3 / 20 micron Synthetic Non-Woven media filter. The filter shall be encased in housing which will form an integral part of dehumidifier with aluminium construction.</p> <p>Housing for Pre Cooling Coil. This shall be duly insulated and shall form an integral part of unit. The section need insulated drain pan, drain pan should be 18 G SS 304 construction. Inner skin with SS 304 and outer skin with PGCI sheet of 22 gauge with nitrile rubber insulation 19 mm thick.</p> <p>Dehumidifier section with desiccant honeycomb rotor / bed mounted on a horizontal fixed shaft arrangement & 100% Electrical heater bank.</p> <p>Fan should be DIDW Centrifugal type with process motor. Bed Drive unit with drive rotor. Reactivation Motor with reactivation fan.</p> <p>Thermostat, 30 to 300 deg. C range - 2 Nos</p> <p>The dehumidifier units should have volume control dampers at Supply, Return, Fresh Air, Reactivation air inlet & outlet Electrical control panel comprising of all electrical components and controller as required for an effective operation shall be provided with dehumidifier.</p> <p>Note: • Dehumidifier capacity to be decided by bidder to serve the respective AHUs.</p> <ul style="list-style-type: none"> • Pan type steam generating humidifier for AHU's have to be considered based on design requirement. Qty – 1 No Heater is also required for making proper humidity condition. 		
C	Ducting		
17	GI Ducting		
	Supply of material, fabrication, installation, testing and commissioning of air-conditioning ducts complete with all accessories such as bends, elbows, transition pieces, support, Flange etc. of following material & thickness sheets as per site requirement. GSM120		
a	20G GI duct	m ²	
b	22G GI duct	m ²	
c	24G GI duct	m ²	
d	MS Angle (oil paint)	Kg.	
18	Insulation with XLP foil		





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	Supply and installation of closed cell class 0 "ZERO" nitrile rubber insulation on GI ducts covered with 26G aluminium cladding complete with all accessories like adhesive, jointing tap, hardware etc. Please quote also without Al cladding.		
a	19mm insulation for Return	m ²	
19	Volume Control Damper		
a	Supply and installation of manually operated, multi louvered, opposed aerofoil blade volume control damper with outer body frame and blades fabricated out of GI section complete with other accessories such as locking arrangement, geartrain, handle, position indicator etc..	m ²	
20	Fire and smoke damper		
a	Supply and installation of motorised fire cum smoke control damper of following sizes complete with fire & smoke sensors, actuator, control panel, linkage and other accessories.	m ²	
21	Field devices		
	Supply, installation, testing and commissioning of following instruments for measurement and control of various parameters.		
a	Differential Pressure Switch (Filter status)	Nos	
b	Differential Pressure Switch (Fan running status)	Nos	
c	Duct Temp & RH Sensor (air), Temp - 10 - 50 deg c & RH – 10 % - 100 %	Nos	
d	Smoke sensor	Nos	
e	Relative humidity sensor (10% to 100 %)	Nos	
f	Airstat/ air flow switch suitable for on-off operation of heaters of AHUs.	Nos	
g	Room temp & RH sensor	Nos	
h	Room differential pressure sensor	Nos	
22	Instrumentation cables		
a	Supply, installation and commissioning of cables/conduits for lighting, humidity sensors, temperature sensors, smoke detectors, alarms, CCTV cameras, internet, LAN and other equipment needed for the Clean Room Functioning.		
b	Laying of PVC conduit 25mm and 40 mm dia at locations indicated inside the Clean Room for supplying power to processing equipment inside the Clean Room along the walls.	Mtr	
F	Electrical		
23	MCC panel		
	Electrical panels: Design, fabrication, supply, installation, testing, commissioning of 3 phase, 4-wire, CRCA fabricated, duly powder coated power control center (PCC)/motor control center (MCC). Motor/power control center.		
a	MCC panel for 2 AHUs, 2 Dehumidifier, 1 Exhaust Blower, 2 distribution BOX	Nos	





24	Distribution Box		
	Electrical panels: Design, fabrication, supply, installation, testing, commissioning of 3 phase & 1 phase,4-wire/ 2 wire, CRCA fabricated, duly powder coated distribution box for all Field Devices and other equipment.		
25	Earthing strip		
a	Supply and laying GI earthing strip with earthing pit / wire with accessories in cable tray / wall/ floor.	Mtr	
26	BIOMETRIC ACCESS CONTROL SYSTEM AND DOOR INTERLOCK FOR GOWNING AREA		
	Supply, installation, testing and commissioning of SingleDoor Biometric Finger Print based Access Control System with followingspecification: Optical finger print sensor with at least 500 dpi resolutionStorage of up to 5000 transactions & supports 500 card holders. The controller shall store not less than 500 finger printtemplates. The controller should communicate withTCP/IP interface. The door controller shall work between a humidity range ofRH 5~ 95 % non condensing humidity and between temperature range of 0 to 45 degrees. The controller shall be configurable via windows basedAccess Control software. The controller shall be configurable via Electromagnetic Lock / Drop Bolt Lock with fail secure mode / Electronic lockwith mechanical Lock. The controller shall have a Exit Switch provision to open the door from inside.	Each	
a	Supply, installation, testing and commissioning of 12V,10 Amps SMPS unit (as per the systems voltage requirement tostep down the available 220V AC supply) for providing power supply	Nos	
b	Supply & installation of Exit Switch from inside door complete with connection as required	Nos	
c	Supply & installation of Drop Bolt lock with emergency mechanical release key along with other fixing accessories etc. complete as required	Nos	
d	Supply & installation of electromagnetic lock 600 lbs withlock along with other fixing accessories etc. complete as required.	Nos	
g	Door interlock system with electromagnetic locks, control panel, push buttons all complete for door	Each	
27	CCTV		
a	Supply, Installation, Testing and commissioning of 32 PortNetwork Video Recorder (NVR): <ul style="list-style-type: none">• Up to 5 Megapixels resolution recording• HDMI and VGA output at up to 1920×1080P resolution• 32-ch network cameras can be connectedwith25M/50M/100M incoming bandwidth Up to 2 SATA interfaces	Nos	
b	Supply, Installation, Testing and commissioning of 1.3MPPTZ Dome Network Camera 1/3''		





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	Progressive Scan CMOS • 1280 × 960 HD resolution • 30X / 20X optical zoom, 16X digital zoom • True Day/Night, 3D DNR, Digital WDR • 3D intelligent positioning 24VAC / PoE+ power supply	Nos	
c	Supply, Installation, Testing and commissioning of 32 Port 10/100 Desktop Switch with 32 port PoE	Nos	
d	Supply, Installation, Testing and commissioning of HDD Internal 2TB Surveillance.	Nos	
e	Supplying and installation of 42 inch HD LED TV with support	Nos	
f	Supply, Installation, Testing and commissioning of Cat 6 Ethernet Cable with Laying and fixing under conduit	Mtr	
g	Supply, Installation, Testing and commissioning of I/O Box with installation with SMB	Nos	
h	Supply, Installation, Testing and commissioning Power supply unit of PTZ camera	Nos	
i	Supply, Installation, Testing and commissioning of 1.5 sq. mm. 3 core power supply cable of PTZ cctv	Nos	
j	Supply, Installation, Testing and commissioning 9U rack for NVR and switch mounting	Nos	
k	Supply, Installation, Testing and commissioning of 2 core 1.5 sq. mm wire	Mtr	
28	Smoke Detector		
a	Supply, Installation, Testing and commissioning of Smoke detector	Nos	
b	Supply, Installation, Testing and commissioning of Junction box for smoke detector	Nos	
c	Fire Panel 4 zones, hooter, MCP, RI Indicator, Isolator	Lot	
29	Manual Exhaust system		
	General Exhaust Blower with return Risers operated from outside Clean Room		
	Supply, installation, testing and commissioning of Exhaustblower 2100 m ³ /hr @ 150mm wg. Centrifughal exhaust blower assembly.MOC for casing: PP+FRP MOC for Impeller: PPMotor: (ABB Make) Current: 415V Drive: Direct Pedestal : M.S with paint Base frame : M.S with paint		
a	2100 m ³ /hr @ 150mmwg (1W + 1S) (The Capacity to be decided by Designer.)	Nos	
30	CIVIL WORKS :		
a	Necessary Civil Works needed for the completion of the clean room. The same shall be discussed and scope and quantum of work to be decided		
31	Comprehensive warranty 5 years		
32	Delivery Period: within 12 weeks after receiving thePO		
33	Bidder Qualification Criteria: EXPERIENCE:		





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<p>Bidder should have established similar clean room in institutes like IITs, DRDO, IISER, National University, Research Lab etc. or Companies along with completion certificate from Users. (Class 10,000 or better)</p> <p>Bidder should submit relevant documents such as PO's, Installation certificate, Contact references for evaluation processes.</p> <p>A site visit is mandatory before submitting the bid</p>		
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