

INDIAN INSTITUTE OF TECHNOLOGY KANPUR

DEPARTMENT OF CHEMISTRY

DATED: 23/06/2017

Kindly send us sealed quotations for the following items against tender number **IITK/CHM/JKB/17-18/07**. Quotations should be addressed to Prof. Jitendra K. Bera, Chemistry Department, IIT Kanpur, Kanpur - 208016. Please send technical and financial bids separately. The last date for receipt of sealed quotations is 11/**07/2017**. Last date submission of tender is 11.7.2017.

General Terms and Conditions for Pre-Qualification Criteria

1. Bidders should submit at least 3 purchase orders and work completion certificates specifically from of IIT Kanpur or any other IIT's stating the quality of work and overall feedback of Project with good values.
2. Bidder or its parent company should be a member of ASHRAE & SEFA since 2012 on a continuous basis.
3. Bidder/ Parent company should submit third party test report for fume hoods.
4. Additional Certificates to be submitted by the bidder/parent company:
 - A). ISO 9001-2008 (For Manufacturing, Supply and installation of fume hood systems, Equipment's & Laboratory Furniture)
 - B).OHSAS 18001:2007 (For Design, Manufacturing, Supply and Installation of Fume Hood Systems, Equipment's and Laboratory Furniture)
 - C).ISO 14001:2004 (For Design, Manufacturing, Supply and Installation of Fume Hood Systems, Equipment's & Laboratory furniture)
5. The bidder or its parent company in India or abroad should have a well-established (their own) in house manufacturing unit for steel lab furniture and fume hood. Quality management system should be as per International standards providing products and services on the continuous basis for the last 7 years. The bidder or its parent company in India or abroad should possess a current/valid license for manufacturing of such items by a statutory certifying authority, like factory inspector etc. Manufacturers should have 100% modern and sophisticated manufacturing facility, having strict quality checks at every level. Documentary evidence required.

6. 1000 hour salt spray test report (by third party) for powder coating quality assurance also must be attached with the technical bid.
7. MOC of the Fume Hood externally should be of GI (Galvanized Iron) sheets with Epoxy Powder coating only, 1-1.3 mm & Internal working area with base cabinet should be chemical resistant.
8. IIT Kanpur will have right to visit the factory site for the inspection of factory work & materials as when required.
9. The bidder should have ASHRAE Testing Facilities with lab of its own, where ASHRAE testing can be done.
- 10.. Bidder / parent company will have to submit a “No Deviation” compliance sheet, any deviation from the technical specification will lead to cancelation of work/purchase order.
11. The Bidder should have a sufficient turnover for the last 4 years. Documentary evidence required.

Specific Terms and Conditions

Specifications for fume hoods (four) Chemical storage cabinets (five) Spot extractors (two)

Fume Hood - I

Overall Dimensions with base cabinet:	1500 mm W X 1000 mm D X 2400 mm H
Fume Hood dimensions:	1500 mm W X 1000 mm D X 1555 mm H
Base Cabinet dimensions:	710 mm W X 600 mm D X 655 mm H with Castors – 2nos
Inside Fume Hood working volume:	1220 mm W X 750 mm D X 1180 mm H
Bed size:	1220 mm W X 750 mm D
Quantity:	01no.

Sr. No	Specification	Description
1	Equipment and usage	Fume hood for Regular usage
2	Design Basis	American Design Standard: ASHRAE110- 1995 All tests including “Tracer gas containment test” passed. European Design Standard: EN-14175- 2003 ‘Inner Plane Containment test’ passed.
3	Design Structure	Aerodynamic, Floor mounted
4	Airflow Type	Low Constant Volume
5	Colour Combination	Grey & White
6	Powder coating	Pre-treated with 8 tank chemical processes and powder coated with highly chemical resistant epoxy Colours having dry film thickness of 70 to 80 microns. Passes all conformity performance tests as per IS standards.
7	Material of Construction of superstructure	Galvanized Iron (GI) as per IS 277: 2003 standard of <ul style="list-style-type: none"> • 1.0 mm thickness for all sheet metal paneling • 1.2 mm for back pillars • 1.2 mm for front corner post

8	Front Top Panel	Easily open-able hinged Top Panel for easy access to Flow Control Valve and Electrical Lighting fixtures for maintenance.
9	Corner Post	Triangular profiled Corner Post is placed on Left and Right Hand Side of the Fume hood and it houses the utility line fittings and electrical receptacles.
10	Construction (Interior)	Chemical & Heat Resistant, Fire Retardant, Smooth Finish, Easily Cleanable Panels Made out of durable PRL integral work walls (6 mm thick). ASTM flame spread index < 25.
11	Active Kinetics exhaust system	<u>Interstitial</u> 7-point active kinetics exhaust system (for light, normal & heavy fumes) with baffle to ensure rapid exhaust of fumes.
12	Airfoil	Aerodynamic Design, Horizontal fixed airfoil mounted on the worktop made of SS 304 (1.2mm) Teflon Coated .
13	Worktop	Chemical resistant splash & spillage proof dished ' Jet Black Granite ' worktop (18 ±1 mm thick). Skirting of 15 mm from all sides for no chemical spillage.
14	Sink, Water tap with drain arrangement	Worktop will have sink sealed with silicon sealant for drainage with water tap on left back side of worktop. Sink will have a trap for waste collection. <ul style="list-style-type: none"> • Cup sink 100 mm Dia
15	Sash (Shutter)	Vertical rising sash counter-balanced with pulley and counter-weight system. Toughened Float Glass sash (4 mm thick). Smooth and light sash operation. Clear open-able height = 750 mm. Impact Resistance of the sash (Toughened Glass) is four times higher than other sash materials (like Safety Glass and Polycarbonate). Breaking Stress value for fully toughened glass (Tempered Glass) = 24,000 psi.
16	Wet & Dry Service valves	Remotely operated colour coded ' Far, Italy ' make valves for fine control over utilities (as per DIN 12920 norms) total 3 nos. service valves with Stainless Steel tubing with 6mm internal dia, withstands up to 15 kgf pressure and brass fittings for gas connections. (All on LHS) <ul style="list-style-type: none"> • 1 for Raw Water • 1 for Nitrogen • 1 for Vacuum • 1 for Oxygen Located in separate media columns on front of Fume hood.
17	Maintenance ports	<ul style="list-style-type: none"> • Open-able top panel for easy maintenance of tube light and flow control valve • Service panel for maintenance of utility valves and tubing.
18	Internal nozzles	Brass powder coated fittings are staggered in the fume hood to avoid the intermingling of the flexible tubes. Also the taps are tapered in shape to use with flexible tubing of sizes from ¼" to ½" in dia, to provide greater flexibility to the user. Note: The scope of supply for utility lines ends at 1/4 th BSP male adopter.
19	Lighting	Fluorescent light (40 watt, 2 Nos.) with vapour-proof fitting for proper illumination. Intensity approx 400 lux at worktop level.
20	Electrical Utilities	4 nos. electrical sockets 'North West/Norisys' make (230 V, 6/16 A, 50 Hz), 4 nos. 'North West/Norisys' make MCBs with blower NO/NC switch with built –in starter & light switch on front fascia. Horizontally beneath the work space and above the base cabinet. Cables & wires ' Fire Retardant Low Smoke ' grade.
21	Built-in Starter	The electrical wiring will have built-in starter of "Telemechanique" make; suitable to blower motor capacity.

22	Cable entering port	For easy access of cables from fume hood to electrical sockets.
23	Base Cabinet (Ventilated & on castors)	<p>Base cabinet will be ready to receive the fume hood at its top. It will have following features:</p> <ol style="list-style-type: none"> 1) Completely made from 1mm thick GI sheet with Highly corrosion resistant epoxy powder coating, 60-80 microns thickness. 2) Cabinet integral work walls will be Special chemical & heat resistant, smooth finish, easily cleanable panels made out of durable PRL sheets. 3) One exhaust port (cabinet holding the vacuum pump) connected to the fume hood exhaust system internally. 4) One removable horizontal partition to accommodate vacuum pump. 5) PP Trays for chemical storage. 6) Cabinets on castors. 7) Roller catch of "HAFELE" – Germany" Make for the Base Cabinet doors. 8) Polyamide Hinges from outside of Base Cabinet. <p>Overall Dimensions: 710mm (W) X 600mm (D) X 655mm (H) with Castors – 2nos</p>
24	Apparatus Holding Grid (Lattice Assembly)	A grid made up of SS 304 to hold the apparatus. It will cover the entire length of the fume hood and will be built-in at fume hood backside. Installed at the distance of 150 mm from backside of fume hood.
25	Level adjusting screws	Made of SS Bolts to adjust the fume hood level by ± 10 mm.
26	Exhaust Port	Unique exhaust port design ensures that the fumes will be exhausted smoothly without any turbulence at the exhaust port. Also it ensures low noise level.
27	Flow control valve	To regulate airflow.
28	Noise Level	< 70db at 1 meter from fume hood.
29	Cover Ceiling Panel	To hide ducting

CENTRIFUGAL BLOWER: (For air suction for 1500mmW. Fume hood) - 1No

Silent PP+FRP high efficiency remote blower consisting of continuous rating motor and chemical resistant impeller. It satisfies international safe velocity norms.

Sr. No	Specification	Description
1	Construction	SISW type, chemical & heat resistant PP + FRP blower with aerodynamically balanced PP impeller, with drain plug.
2	Air Suction Capacity	600 CFM conforming to international face velocity norms and as per safe fume hood airflow pattern.
3	Motor	' Crompton / LHP/Other Reputed ' make, 1 HP Motor 3 Phase TEFC, IP 55, Class F, continuous rating. As per IS 325.
4	Drive	Direct Drive

Fume Hood - II

Overall Dimensions with base cabinet:

1500 mm W X 1000 mm D X 2400 mm H

Fume Hood dimensions:

1500 mm W X 1000 mm D X 1555 mm H

Base Cabinet dimensions:
2nos

710 mm W X 600 mm D X 655 mm H with Castors –

Inside Fume Hood working volume:

1220 mm W X 750 mm D X 1180 mm H

Bed size:

1220 mm W X 750 mm D

Quantity:

01no.

Sr. No	Specification	Description
1	Equipment and usage	Fume hood for Regular usage
2	Design Basis	American Design Standard: ASHRAE110- 1995 All tests including "Tracer gas containment test" passed. European Design Standard: EN-14175- 2003 'Inner Plane Containment test' passed.
3	Design Structure	Aerodynamic, Floor mounted
4	Airflow Type	Low Constant Volume
5	Colour Combination	Grey & White
6	Powder coating	Pre-treated with 8 tank chemical processes and powder coated with highly chemical resistant epoxy Colours having dry film thickness of 70 to 80 microns. Passes all conformity performance tests as per IS standards.
7	Material of Construction of superstructure	Galvanized Iron (GI) as per IS 277: 2003 standard of <ul style="list-style-type: none"> • 1.0 mm thickness for all sheet metal paneling • 1.2 mm for back pillars • 1.2 mm for front corner post
8	Front Top Panel	Easily open-able hinged Top Panel for easy access to Flow Control Valve and Electrical Lighting fixtures for maintenance.
9	Corner Post	Triangular profiled Corner Post is placed on Left and Right Hand Side of the Fume hood and it houses the utility line fittings and electrical receptacles.
10	Construction (Interior)	Chemical & Heat Resistant, Fire Retardant, Smooth Finish, Easily Cleanable Panels Made out of durable PRL integral work walls (6 mm thick). ASTM flame spread index < 25.
11	Active Kinetics exhaust system	<u>Interstitial</u> 7-point active kinetics exhaust system (for light, normal & heavy fumes) with baffle to ensure rapid exhaust of fumes.
12	Airfoil	Aerodynamic Design, Horizontal fixed airfoil mounted on the worktop made of SS 304 (1.2mm) Teflon Coated.
13	Worktop	Chemical resistant splash & spillage proof dished ' Jet Black Granite ' worktop (18 ±1 mm thick). Skirting of 15 mm from all sides for no chemical spillage.
14	Sink, Water tap with drain arrangement	Worktop will have sink sealed with silicon sealant for drainage with water tap on left back side of worktop. Sink will have a trap for waste collection. <ul style="list-style-type: none"> • Cup sink 100 mm Dia
15	Sash (Shutter)	Vertical rising sash counter-balanced with pulley and counter-weight system. Toughened Float Glass sash (4 mm thick). Smooth and light sash operation. Clear openable height = 750 mm. Impact Resistance of the sash (Toughened Glass) is four times higher than other sash materials (like Safety Glass and Polycarbonate). Breaking Stress value for fully toughened glass (Tempered Glass) = 24,000 psi.

16	Wet & Dry Service valves	Remotely operated colour coded ' Far, Italy ' make valves for fine control over utilities (as per DIN 12920 norms) total 3 nos. service valves with Stainless Steel tubing with 6mm internal dia, withstands up to 15 kgf pressure and brass fittings for gas connections. (All on LHS) <ul style="list-style-type: none"> • 1 for Raw Water • 1 for Nitrogen • 1 for Vacuum • 1 for Hydrogen (High Pressure line) Located in separate media columns on front of Fume hood.
17	Maintenance ports	<ul style="list-style-type: none"> • Open-able top panel for easy maintenance of tube light and flow control valve • Service panel for maintenance of utility valves and tubing.
18	Internal nozzles	Brass powder coated fittings are staggered in the fume hood to avoid the intermingling of the flexible tubes. Also the taps are tapered in shape to use with flexible tubing of sizes from ¼" to ½" in dia, to provide greater flexibility to the user. Note: -The scope of supply for utility lines ends at 1/4 th BSP male adapter.
19	Lighting	Fluorescent light (40 watt, 2 Nos.) with vapour-proof fitting for proper illumination. Intensity approx 400 lux at worktop level.
20	Electrical Utilities	4 nos. electrical sockets 'North West/Norisys' make (230 V, 6/16 A, 50 Hz), 4 nos. 'North West/Norisys' make MCBs with blower NO/NC switch with built –in starter & light switch on front fascia. <u>Horizontally beneath the work space and above the base cabinet.</u> Cables & wires 'Fire Retardant Low Smoke' grade.
21	Built-in Starter	The electrical wiring will have built-in starter of "Telemechanique" make; suitable to blower motor capacity.
22	Cable entering port	For easy access of cables from fume hood to electrical sockets.
23	Base Cabinet (Ventilated & on castors)	Base cabinet will be ready to receive the fume hood at its top. It will have following features: <ol style="list-style-type: none"> 1) Completely made from 1mm thick GI sheet with Highly corrosion resistant epoxy powder coating,60-80 microns thickness. 2) Cabinet integral work walls will be Special chemical & heat resistant, smooth finish, easily cleanable panels made out of durable PRL sheets. 3) One exhaust port (cabinet holding the vacuum pump) connected to the fume hood exhaust system internally. 4) One removable horizontal partition to accommodate vacuum pump. 5) PP Trays for chemical storage. 6) Cabinets on castors. 7) Roller catch of "HAFELE"– Germany" Make for the Base Cabinet doors. 8) Polyamide Hinges from outside of Base Cabinet. Overall Dimensions: 710mm (W) X 600mm (D) X 655mm (H) with Castors – 2nos
24	Apparatus Holding Grid (Lattice Assembly)	A grid made up of SS 304 to hold the apparatus. It will cover the entire length of the fume hood and will be built-in at fume hood backside. Installed at the distance of 150 mm from backside of fume hood.
25	Level adjusting screws	Made of SS Bolts to adjust the fume hood level by ± 10 mm.

26	Exhaust Port	Unique exhaust port design ensures that the fumes will be exhausted smoothly without any turbulence at the exhaust port. Also it ensures low noise level.
27	Flow control valve	To regulate airflow.
28	Noise Level	< 70db at 1 meter from fume hood.
29	Cover Ceiling Panel	To hide ducting

CENTRIFUGAL BLOWER: (For air suction for 1500mm W. Fume hood) - 1No

Silent PP+FRP high efficiency remote blower consisting of continuous rating motor and chemical resistant impeller. It satisfies international safe velocity norms.

Sr. No	Specification	Description
1	Construction	SISW type, chemical & heat resistant PP + FRP blower with aerodynamically balanced PP impeller, with drain plug.
2	Air Suction Capacity	600 CFM confirming to international face velocity norms and as per safe fume hood airflow pattern.
3	Motor	' Crompton / LHP/Other Reputed ' make, 1 HP Motor 3 Phase TEFC, IP 55, Class F, continuous rating. As per IS 325.
4	Drive	Direct Drive

Fume Hood - III

Low-bench Solvent Distillation Hood

Overall Dimensions with base cabinet: 2400 mm W X 1000 mm D X 2400 mm H
 Fume Hood dimensions: 2400 mm W X 1000 mm D X 1855 mm H
 Base Cabinet dimensions: 1140 mm W X 600 mm D X 355 mm H with Castors – 2nos
 Inside Fume Hood working volume: 2120 mm W X 750 mm D X 1480 mm H
 Bed size: 2120 mm W X 750 mm D

IMPORTANT: Clear available vertical space must be more than 1200 mm considering the slanting in the roof. Slanting must begin at least 300 mm from the front of the hood.

Quantity: 1no.

Sr. No	Specification	Description
1	Equipment and usage	Fume hood for Regular usage
2	Design Basis	American Design Standard: ASHRAE110- 1995 All tests including "Tracer gas containment test" passed. European Design Standard: EN-14175- 2003 'Inner Plane Containment test' passed.
3	Design Structure	Aerodynamic, Floor mounted
4	Airflow Type	Low Constant Volume
5	Colour Combination	Grey & White
6	Powder coating	Pre-treated with 8 tank chemical processes and powder coated with highly chemical resistant epoxy Colours having dry film thickness of 70 to 80 microns. Passes all conformity performance tests as per IS standards.
7	Material of Construction of superstructure	Galvanized Iron (GI) as per IS 277: 2003 standard of <ul style="list-style-type: none"> 1.0 mm thickness for all sheet metal paneling

		<ul style="list-style-type: none"> • 1.2 mm for back pillars • 1.2 mm for front corner post
8	Front Top Panel	Easily open-able hinged Top Panel for easy access to Flow Control Valve and Electrical Lighting fixtures for maintenance.
9	Corner Post	Triangular profiled Corner Post is placed on Left and Right Hand Side of the Fume hood and it houses the utility line fittings and electrical receptacles.
10	Construction (Interior)	Chemical & Heat Resistant, Fire Retardant, Smooth Finish, Easily Cleanable Panels Made out of durable PRL integral work walls (6 mm thick). ASTM flame spread index < 25.
11	Active Kinetics exhaust system	<u>Interstitial</u> 7-point active kinetics exhaust system (for light, normal & heavy fumes) with baffle to ensure rapid exhaust of fumes.
12	Airfoil	Aerodynamic Design, Horizontal fixed airfoil mounted on the worktop made of SS 304 (1.2mm) Teflon Coated.
13	Worktop	Chemical resistant splash & spillage proof dished ' Jet Black Granite ' worktop (18 ±1 mm thick). Skirting of 15 mm from all sides for no chemical spillage.
14	Sink, Water tap with drain arrangement	Worktop will have sink sealed with silicon sealant for drainage with water tap on left back side of worktop. Sink will have a trap for waste collection. <ul style="list-style-type: none"> • Cup sink 100 mm Dia
15	Sash (Shutter)	Vertical rising sash counter-balanced with pulley and counter-weight system. Toughened Float Glass sash (4 mm thick). Smooth and light sash operation. Clear openable height = 750 mm. Impact Resistance of the sash (Toughened Glass) is four times higher than other sash materials (like Safety Glass and Polycarbonate). Breaking Stress value for fully toughened glass (Tempered Glass) = 24,000 psi.
16	Wet & Dry Service valves	Remotely operated colour coded ' Far, Italy ' make valves for fine control over utilities (as per DIN 12920 norms) total 1 nos. service valves with Stainless Steel tubing with 6mm internal dia, withstands up to 15 kgf pressure and brass fittings for gas connections. (All on LHS) <ul style="list-style-type: none"> • 1 for Nitrogen Located in separate media columns on front of Fume hood.
17	Maintenance ports	<ul style="list-style-type: none"> • Open-able top panel for easy maintenance of tube light and flow control valve • Service panel for maintenance of utility valves and tubing.
18	Internal nozzles	Brass powder coated fittings are staggered in the fume hood to avoid the intermingling of the flexible tubes. Also the taps are tapered in shape to use with flexible tubing of sizes from ¼" to ½" in dia, to provide greater flexibility to the user. Note: - The scope of supply for utility lines ends at 1/4 th BSP male adopter.
19	Lighting	Fluorescent light (40 watt, 2 Nos.) with vapour-proof fitting for proper illumination. Intensity approx 400 lux at worktop level.
20	Electrical Utilities	6 nos. electrical sockets 'North West/Norisys' make (230 V, 6/16 A, 50 Hz), 6 nos. 'North West/Norisys' make MCBs with blower NO/NC switch with built –in starter & light switch on front fascia. Horizontally beneath the work space and above the base cabinet. Cables & wires ' Fire Retardant Low Smoke ' grade. (3 RHS+3 LHS) .
21	Built-in Starter	The electrical wiring will have built-in starter of "Telemechanique" make; suitable to blower motor capacity.
22	Cable entering port	For easy access of cables from fume hood to electrical sockets.

23	Base Cabinet (Non-Ventilated & on castors)	<p>Base cabinet will be ready to receive the fume hood at its top. It will have following features:</p> <ol style="list-style-type: none"> 1) Completely made from 1mm thick GI sheet with Highly corrosion resistant epoxy powder coating, 60-80 microns thickness. 2) Cabinet integral work walls will be Special chemical & heat resistant, smooth finish, easily cleanable panels made out of durable PRL sheets. 3) One removable horizontal partition to store chemicals. 4) PP Trays for chemical storage. 5) Cabinets on castors. 6) Roller catch of "HAFELE"– Germany" Make for the Base Cabinet doors. 7) Polyamide Hinges from outside of Base Cabinet. <p>Overall Dimensions: 990mm(W) X 600mm(D) X 355mm(H) with Castors – 2 nos.</p>
24	Apparatus Holding Grid (Lattice Assembly)	A grid made up of SS 304 to hold the apparatus. It will cover the entire length of the fume hood and will be built-in at fume hood backside. Installed at the distance of 250 mm from backside of fume hood.
25	Level adjusting screws	Made of SS Bolts to adjust the fume hood level by ± 10 mm.
26	Exhaust Port	Unique exhaust port design ensures that the fumes will be exhausted smoothly without any turbulence at the exhaust port. Also it ensures low noise level.
27	Flow control valve	To regulate airflow.
28	Noise Level	< 70db at 1 meter from fume hood.
29	Cover Ceiling Panel	To hide ducting
30	Available vertical space	Clear available vertical space must be more than 1200 mm considering the slanting in the roof. Slanting must begin at least 300 mm from the front of the hood.

CENTRIFUGAL BLOWER: (For air suction for 2400 mmW . Fume hood) - 1No

Silent PP+FRP high efficiency remote blower consisting of continuous rating motor and chemical resistant impeller. It satisfies international safe velocity norms.

Sr. No	Specification	Description
1	Construction	SISW type, chemical & heat resistant PP + FRP blower with aerodynamically balanced PP impeller, with drain plug.
2	Air Suction Capacity	1050 CFM confirming to international face velocity norms and as per safe fume hood airflow pattern.
3	Motor	' Crompton / LHP/Other Reputed ' make, 1.5 HP Motor 3 Phase TEFC, IP 55, Class F, continuous rating. As per IS 325.
4	Drive	Direct Drive

Fume Hood - IV

Overall Dimensions with base cabinet:	1800 mm W X 1000 mm D X 2400 mm H
Fume Hood dimensions:	1800 mm W X 1000 mm D X 1555 mm H
Base Cabinet dimensions:	860 mm W X 600 mm D X 655 mm H with Castors – 2nos
Inside Fume Hood working volume:	1520 mm W X 750 mm D X 1180 mm H
Bed size:	1520 mm W X 750 mm D
Quantity:	1no.

Sr. No	Specification	Description
1	Equipment and usage	Fume hood for Regular usage
2	Design Basis	American Design Standard: ASHRAE110- 1995 All tests including "Tracer gas containment test" passed. European Design Standard: EN-14175- 2003 'Inner Plane Containment test' passed.
3	Design Structure	Aerodynamic, Floor mounted
4	Airflow Type	Low Constant Volume (for A.C. environment)
5	Colour Combination	Grey & White
6	Powder coating	Pre-treated with 8 tank chemical processes and powder coated with highly chemical resistant epoxy Colours having dry film thickness of 70 to 80 microns. Passes all conformity performance tests as per IS standards.
7	Material of Construction of superstructure	Galvanized Iron (GI) as per IS 277: 2003 standard of <ul style="list-style-type: none"> • 1.0 mm thickness for all sheet metal paneling • 1.2 mm for back pillars • 1.2 mm for front corner post
8	Front Top Panel	Easily open-able hinged Top Panel for easy access to Flow Control Valve and Electrical Lighting fixtures for maintenance.
9	Corner Post	Triangular profiled Corner Post is placed on Left and Right Hand Side of the Fume hood and it houses the utility line fittings and electrical receptacles.
10	Construction (Interior)	Chemical & Heat Resistant, Fire Retardant, Smooth Finish, Easily Cleanable Panels Made out of durable PRL integral work walls (6 mm thick). ASTM flame spread index < 25.
11	Active Kinetics exhaust system	<u>Interstitial</u> 7-point active kinetics exhaust system (for light, normal & heavy fumes) with baffle to ensure rapid exhaust of fumes.
12	Airfoil	Aerodynamic Design, Horizontal fixed airfoil mounted on the worktop made of SS 304 (1.2mm) Teflon Coated
13	Worktop	Chemical resistant splash & spillage proof dished ' Jet Black Granite ' worktop (18 ±1 mm thick). Skirting of 15 mm from all sides for no chemical spillage.
14	Sink, Water tap with drain arrangement	Worktop will have sink sealed with silicon sealant for drainage with water tap on left & right back side of worktop. Sink will have a trap for waste collection. <ul style="list-style-type: none"> • Cup Sink 100 mm Dia
15	Sash (Shutter)	Vertical rising sash counter-balanced with pulley and counter-weight system. Polycarbonate Glass sash (4 mm thick). Smooth and light sash operation. Clear openable height = 750 mm.
16	Wet & Dry Service valves	Remotely operated colour coded ' Far, Italy ' make valves for fine control over utilities (as per DIN 12920 norms) total 3 nos. service valves with Stainless Steel tubing with 6mm internal dia, withstands up to 15 kgf pressure and brass fittings for gas connections. (All on LHS) <ul style="list-style-type: none"> • 1 for Raw Water • 1 for Nitrogen • 1 for Vacuum Located in separate media columns on front of Fume hood.
17	Maintenance ports	<ul style="list-style-type: none"> • Open-able top panel for easy maintenance of tube light and flow control valve • Service panel for maintenance of utility valves and tubing.

18	Internal nozzles	Brass powder coated fittings are staggered in the fume hood to avoid the intermingling of the flexible tubes. Also the taps are tapered in shape to use with flexible tubing of sizes from ¼” to ½” in dia, to provide greater flexibility to the user. Note: The scope of supply for utility lines ends at 1/4 th BSP male adopter.
19	Lighting	Fluorescent light (40 watt, 2 Nos.) with vapour-proof fitting for proper illumination. Intensity approx 400 lux at worktop level.
20	Electrical Utilities	4 nos. electrical sockets ‘North-West/Norisys’ make (230 V, 6/16 A, 50 Hz), 4 nos. ‘North-West/Norisys’ make MCBs with blower NO/NC switch with built –in starter & light switch on front fascia. <u>Horizontally beneath the work space and above the base cabinet.</u> Cables & wires ‘Fire Retardant Low Smoke’ grade.
21	Built-in Starter	The electrical wiring will have built-in starter of “Telemechanique” make; suitable to blower motor capacity.
22	Cable entering port	For easy access of cables from fume hood to electrical sockets.
23	Base Cabinet (Ventilated & on castors)	Base cabinet will be ready to receive the fume hood at its top. It will have following features: 1) Completely made from 1mm thick GI sheet with Highly corrosion resistant epoxy powder coating, 60-80 microns thickness. 2) Cabinet integral work walls will be Special chemical & heat resistant, smooth finish, easily cleanable panels made out of durable PRL sheets. 3) One exhaust port (cabinet holding the vacuum pump) connected to the fume hood exhaust system internally. 4) One removable horizontal partition to accommodate vacuum pump. 5) PP Trays for chemical storage. 6) Cabinets on castors. 7) Roller catch of “HAFELE” – Germany” Make for the Base Cabinet doors. 8) Polyamide Hinges from outside of Base Cabinet. Overall Dimensions: 860mm(W) X 600mm(D) X 655mm(H) with Castors – 2nos.
24	Apparatus Holding Grid (Lattice Assembly)	A grid made up of SS 304 to hold the apparatus. It will cover the entire length of the fume hood and will be built-in at fume hood backside. Installed at the distance of 150 mm from backside of fume hood.
25	Level adjusting screws	Made of SS Bolts to adjust the fume hood level by \pm 10 mm.
26	Exhaust Port	Unique exhaust port design ensures that the fumes will be exhausted smoothly without any turbulence at the exhaust port. Also it ensures low noise level.
27	Flow control valve	To regulate airflow.
28	Noise Level	< 70db at 1 meter from fume hood.
29	Cover Ceiling Panel	To hide ducting

CENTRIFUGAL BLOWER: (For air suction 1800 mm W. of Fume Hood) - 1no.

Silent PP + FRP high efficiency remote blower, consisting of continuous rating motor and chemical resistant impeller. It satisfies international safe velocity norms.

Sr. No	Specification	Description
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1	Construction	SISW type, chemical & heat resistant PP + FRP blower with aerodynamically balanced PP impeller, with drain plug.
2	Air Suction Capacity	750 CFM confirming to international face velocity norms and as per safe fume hood airflow pattern.
3	Motor	' Crompton / LHP/Other Reputed ' make, 1 HP Motor 3 Phase TEFC, IP 55, Class F, continuous rating. As per IS 325.
4	Drive	Direct Drive

'DUCTING:

Chemical resistant PP + FRP (**3mm + 2mm**) rigid & flexible ductwork from Fume hood to exhaust stack point with weatherproof canopy. Total ducting with horizontal, vertical members, flanges, bends, bracketed supports and gooseneck exhaust stack.

Chemical Storage Cabinets

SPECIFICATIONS FOR CHEMICAL STORAGE CABINET

ITEM	Chemical Storage Cabinet
Overall Dimension:	450mm L X 600mm D X 1800mm H
Quantity:	2 no

Sr. No.	Specification	Description
1	Equipment and usage	"Vertical Chemical Storage Cabinet for Regular usage.
2	Design Structure	Vertical close drawer unit
3	Construction Material	Fabricated with Galvanized Iron Sheets
4	Thickness Of Sheets	1.0 mm
5	Powder Coating	Duly coated with Epoxy Powder for better corrosion Resistance
6	Thickness Of Powder Coating	60-80 microns
7	Construction (Interior)	Sturdy with Drawers & Common Facia
8.	No of Drawer	5 no
9.	Load Capacity	Each drawer should have load capacity 45 Kgs.

ITEM:	Chemical Storage Cabinet with Glass Door
Overall Dimension :	1000mm L x 450mm D x 1800mm H
Quantity :	3 no

Sr. No	Specification	Description
1	Equipment and Usage	Vertical Glass Storage Cabinet for chemical storage
2	Design Structure	Glass storage cabinet
3	Construction Material	Fabricated out with Aluminium Frame

4	Powder Coating	Coated with Epoxy Powder with PRL liner inside for chemical resistance
5	Thickness of PRL liner	4 mm
6	Construction (interior)	Sturdy with Shelves
7	No of Shelves	4 Adjustable Shelves and 1 Fixed Shelves
8	Design of Shelves	Each Shelves has PP Trays

Spot Extractor

SPECIFICATIONS FOR SPOT EXTRACTOR

Equipment Name Spot extractor
Quantity: 2 no

Sr. No.	Specification	Description
1	Equipment and usage	Spot extractor for extracting fumes and vapours of chemicals and toxic gases
2	Design Structure	Efficient and durable having Easily movable extraction. Arms with one hand operation.
3	Construction Material	PP & Aluminium
4	Pipe diameter	Pipe diameters of 75mm and 100mm
5	Ceiling column	1000mm. (Side Connection)
6	Transparent Hood	Diameter 385 mm
7	Air flow	Air flow ranges between 75 to 150 CFM
8	Flow controller	Flow control valve & having proper exhaust system with duct & blower.
9	Ducting	PP + FRP Ducting

CENTRIFUGAL BLOWER: (For air suction for Spot Extractor) - 1No

Silent PP +FRP high efficiency remote blower consisting of continuous rating motor and chemical resistant impeller. It satisfies international safe velocity norms.

Sr. No	Specification	Description
1	Construction	SISW type, chemical & heat resistant PP + FRP blower with aerodynamically balanced PP impeller, with drain plug.
3	Motor	'Crompton / LHP/Other Reputed' make, 1 HP Motor 3 Phase TEFC, IP 55, Class F, continuous rating. As per IS 325.
4	Drive	Direct Drive

INSTALLATION:

It will be carried out by skilled team with ductwork design, fitting, fixing of blower, commissioning & testing of the same at a fixed extra cost.

IQ/OQ/PQ:

Entire IQ/OQ/PQ protocols should be filled up and submitted after completion of the installation.

TESTING:

All fume hoods should be "factory tested" as per **ASHRAE110:1995** face velocity norms. Also, "Onsite Validation" should be carried out to ensure working of fume hood as per international norms.

WARRANTY:

12 months warranty against all manufacturing defects from the date of installation.

AFTER SALES SERVICE: Rate of Annual maintenance contracts after completion of warranty period should be mentioned.