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Department of *Electrical Engineering*
Indian Institute of Technology, Madras
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Ref. No.

ELE	AMIT	2017	WET BENCH
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Date 3/11/2017

Under Certificate of posting

Due Date: 24/11/2017

To

O/c copy

Dear Sirs,

1. Quotations are invited in duplicate for the various items shown below/overleaf/enclosed list.
2. The Quotations duly sealed and superscribed on the envelope with the reference no. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The Quotations should be valid for sixty days from the due date and period of delivery required should also be clearly indicated.
4. If the item is under DGS & D Rate contract, Rate Contract Number and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate Contract price. If so, please send copy of the R.C. (Please note that we are not Direct Demanding Officers).
5. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable.
6. Local Firms: Quotations should be for free delivery to this Institute. If Quotations are for Ex-Godown, delivery charges should be indicated separately.
7. Firms outside Chennai: Quotations should be F.O.R Chennai. If F.O.R consignor station, freight charge by passenger train / lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charges must be indicated.
8. The rate of Sales / General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, claim for Sales / General Taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax applicable to non-Government Educational Institutions run with no profit motive for which a commission Sales Tax certificates will be issued at the time of final settlement of the bill.
9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. Payment: Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.

Specifications enclosed and
 quote to be sent to the
 below address:

Yours faithfully,

Dr. Amitava DasGupta
 Professor,

Dept. of Electrical Engineering
 Indian Institute of Technology, Madras,
 Chennai - 600 036.

Amitava DasGupta

HEAD / Project Co-Ordinator

Technical Specifications for Installation of Polypropylene Wet Chemical Station (1no) with class 100 Laminar flow

It is proposed to install a "Wet Chemical Station" inside the Clean Room Area of our lab as shown in the following figure 1. The complete work will involve design, fabrication and installation of wet chemical station, exhaust system (ducting and blower) inside the lab and roof with suitable dampers and flexible duct, fresh air inlet system (ducting and filter), and chemical storage cabinets in wet station, electrical and plumbing as per our required specifications.

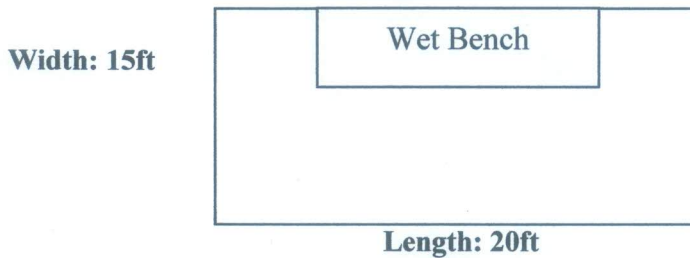


Figure 1. Layout of Room

We require the Wet Station should have perforated Worktop

The specifications are as below.

Construction

- Natural white polypropylene sheet of thickness 10mm for sides and rest of construction with 8mm thick sheets with adjustable leveling feet.
- Section box to be incorporated for polypropylene station rigidity and support.
- Polycarbonate sheet for the Sash.
- Polypropylene drain of size 50mm with union connection to be provided at bottom of the sink base for draining. The drain end connection of the Wet Chemical stations to be connected to existing main drain.
- All materials should be selected for application in the most demanding conditions and should be clean room compatible.
- Overall Dimensions - 1520mm L x 1190mmD x 2400mm H

Worktop

- Half portion of the worktop should be made of 8mm thick natural polypropylene sheets with perforation and chamfered with suitable cut out for housing sinks, DI and N2 gun and rest of the portion with SS316 Stainless Steel thick sheet.
- Worktop spills, chemical spills and spent DI water to be drained to the plenum below and from there to a dedicated main spigot to station rear.

Plumbing

- Water plumbing should be of dia. 20mm CPVC pipe work and should include standard inlet and outlet at rear of the station to minimize the dead legs within

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the pipe work exclusive pipe with front fascia mounted valve for controlling the water.

Lighting

- One number of fireproof yellow tube light with a 2 x 36W for illumination.

Bottom Storage cabinet/chemical trolley

- The stations should be provided with 2 nos. of storage cabinet trolleys for storing materials under the sink base with wheels for movement.

Electrical

- MCB for circuit protection.
- 3 Nos. (multipin) of 15A sockets and switches in front of the station on either side of the wet bench

Sink

- One number of sink fabricated from 8mm thick polypropylene with inner dimension of 250mm x 250mm x 200mm deep with a 20mm drain out let. The sink should be placed such that one can remove for servicing etc., without affecting the other process.

Magnehelic Gauge

- Magnehelic gauge to read the pressure drop across the filter to be provided.

Class 100 Fan Filter Module for class 100 station

- To provide class 100 clean air inside the wet bench, Fan Filter module with HEPA filters should be used. These FFM's should be self-powered grid module with modular design, to fitting in standard T grid ceiling. Total height should be 320mm. The Fan Filter Module should be UL listed and CE certified. FFU speed should vary from 0.2 to .5m/s and air flow rate should vary from 460-760 CFM. The sound level should be less than 55dBs when measured from 760mm below from filter face. The vibration level should be less than 0.9mils.
- Non-washable pre-filters made of polyurethane foam with arresting capacity Of 30 μ should be provided.
- The HEPA filters should be rated 99.99% and should be efficient in removing 0.3 μ or larger particles. Leak free in accordance with latest I.E.S recommended particle. The filter media should be micro glass fiber with poly-string separator, sealed to casing. The filter guard should be provided with diamond pattern expanded sheet for protection.
- The Fan motor drive should be direct drive, forward curve centrifugal type with sealed bearing. The motor should be permanent split capacitor type, rated for

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continuous operation with thermal overload protection with two speed switch. The power requirement is 230V, 50Hz single phase with maximum current of 1.9A with 280watts power input.

- The fan/motor assembly should be capable of delivering air at filter pressure of 9mm to 23mm final state. These FFM should have a speed controller for increasing the speed of the motor/blower from low, medium and high.

Utilities

- Electrical : 230V, 3 phase, 50Hz
- Extraction Dia.: 200mm @ 300 Pascal's
- Town water (supply) for bottle wash sink 20mm MTA @ 3 barg/3 Kg/cm²
- Main drains 50mm union to be connected by other benches.
- Sink Drain 20mm to be connected

DI Water Gun

- DI water gun to be made of virgin Teflon to be provided for a high-pressure water jet.

N2 Air Gun

- N2 gun (1nos) made of virgin Teflon to be provided for a high pressure Nitrogen jet for purging.

Exhaust Requirements

- The blower should be placed at the terrace of the building (building height 20 feet). Exhaust Blower capacity: 900cfm
- PP Damper at the exhaust line main near the blower
- The blower should be noise and vibration free.
- Blower should be installed properly and electrical connection to be provided with suitable starter.
- Blower Output should be properly designed for exhaust.
- Blower outlet should be connected with lengthy ducting with suitable bends and supports(Approx – 10 feet vertical and bend)
- Ducting FRP PVC with VCD- Approximately 35RMT each with Dia. 250mm for the 2 wet stations with damper for wet bench and Dia. 500mm (35RMT) for main piping from bench to blower.

Note:

- Proof of experience for the above mentioned work to be provided as a supporting document.

Amitan Singh