

19 point guide to Laboratory FURNITURE planning

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1. Nature of the facility and the objective of building it:

The pharmaceutical research facility will need a lot of wet labs; but a clinical research facility will need more of analytical laboratories with lot of support area. Hence, the furniture height and utility requirements will change significantly, depending on the requirements. As such the intent of building the facility has to be drawn first.

2. User habits:

User habits play a major role in selection and planning. For example, in a university lab, students tend to store chemicals in the fume hoods and lab furniture; hence it is important to have more chemical storage cabinets below the hoods or furniture. Whereas, in regular research labs, there are designated chemical storage areas and chemicals are usually not stored in lab furniture. Hence, lab furniture planning and material of construction for both labs may be different.

3. Need of flexibility:

A lot of new age research labs need flexibility for future expansion. For such labs; you can look at flexible laboratory furniture options available with most manufacturers. Furniture on castors, ductless fume hoods, ceiling suspended flexible ceiling are such concepts which can help you build flexible labs with ease of re-installation.

4. Capacity and work flows:

Depending on how many researchers will occupy the laboratory, the workup space, fume hoods and seating spaces need to be finalized. Depending on the workflow and work type, walk-in hood, distillation hood or bench-top hoods are selected. Researchers seating and working areas should not be very far.

5. Furniture configuration:

You have many options to choose from: fixed plinth based system, flexible C frame, H frame and castor systems too. Depending on the future expansion plans, a right type of furniture configuration should be opted.

6. Steel or Wood:

Depending on the usage, comfort level of users & user company's internal standards, the material of construction is decided. Powder coated steel or engineered wood are

two main options available today. Each option has its own pros & cons, which have to be weighed before taking a final call.

Further the furniture should be clutter free and ergonomic in design. Cluttered design makes cleaning difficult and adversely impacts material and man movement, creating serious safety implications. For example, movement space between two tables should be 1.5 meters at least. Also, wet lab's furniture should have standing height (900 mm) and instrument lab's furniture should have seating height tables (750 mm) with adequate leg spaces.

7. Worktop finishes:

Every lab will have different needs. Granite is most commonly used; but now there are several other options like Ceramics, phenolic laminates, epoxy tops etc. Biotech laboratory will need worktops which are resistant to microbial growth, whereas a chemical research lab will need a worktop which withstands a lot of aggressive chemicals. So, take the samples from the furniture vendors and test those before making final decision.

8. Chemical storage strategies:

Depending on the type of chemicals, you can decide whether to use corrosive chemical cabinets or flammable solvent storage cabinets. Corrosive cabinets have chemical resistant coatings whereas flammable storage cabinets have capacity to sustain fire for some time. Even in flammable storage cabinets; you have options of FM approved cabinets or 30-90 minutes fire rated cabinets. You need to plan for ventilation of these cabinets too.

9. Extraction systems:

Extraction systems do not fall directly into furniture category; yet they are part of furniture infrastructure. You don't need expensive fume hood to extract fumes everywhere. You can use canopies on wash areas, spot extractors over rotavapours or enclosures over analytical balances. This will help you reduce exhaust volume and also will cut the cost.

10. Pollution control options:

Depending on the type and volume of chemicals, you can decide to opt for either wet scrubbers or dry scrubbers. Also, the exhaust stack must be sized in such a way that fumes do not re-enter the facility. Please check your local pollution control board norm before finalizing this.

11. Compliance with user's suitable standards:

Depending on the customer's requirement of international standard, the lab furniture type will vary. If the customer is a North American company, they will prefer buying hoods which comply with ASHRAE 110: 2016 standard. But if it's a European company, they may want to look at EN 14175: 2003 standard and stick to fume hood performing according to those standards. Same logic applies to lab furniture too.

12. Compliance to safety guidelines:

Safety is the most important aspect in lab design. It is important to take note at the time of detailing, that the furniture edges are rounded and not sharp. The furniture accessories such reagent racks, eye-wash, safety showers etc are placed at ergonomically correct locations to avoid accidents at the time of usage. In case of fire-prone reactions, you should review and check that adequate fire protection arrangements have been made within fume hoods.

13. Maintenance:

Lab furniture does not really need much maintenance; but fume hood & exhaust system does. Typical hood related maintenance problems revolve around blower's breakdown, sash ropes breakage and airflow drop. A right fume hood should have countermeasures or ease of maintenance for all this.

14. Availability of spare parts and durability:

Ensure that the spares & accessories are indeed of reputed brands. A lot of not-so-good quality brands are used and those fail often. Also, another good idea will be to include two years' spares as a part of the contract. A check upon durability is important from the investment and safety point of view.

15. Vendor selection and after sales service:

There is no point in deciding about the vendor, purely on the basis of the brochures.

The decision to buy from a particular vendor should be made after visiting some of his old installations and ascertaining his capabilities. The vendor's compliance to global standards with third party test certificates should also be considered.

It is essential to check whether the company has an authorized local partner/service center in close vicinity to ensure minimum down time.

16. Involvement of all stakeholders:

Users, Project engineers and Architects must be involved for this decision. Otherwise you may expect a lot of re-work and dissatisfaction.

17. Budget:

Depending on the specifications and manufacturer, the prices will vary. For example, one simple 6 feet fume hood can be available in the range of Rs. 1.5 lacs to Rs. 4 lacs. So budgeting is really important. Price difference between imported furniture & Indian furniture can be very significant. If you are an export duty exempt unit, then imported furniture may be a good option for you.

18. The ROI:

Factor in the ROI. A marginally higher investment in VAV fume hoods can save a lot of running cost by cutting down exhaust of conditioned air, blower and AHU sizing. The payback period of such system is typically 18-24 months. Or consider buying a state of the art design style in lab furniture, which will stay relevant for next 20-25 years.

19. Last but not the least - Aesthetics:

One of the most important part and it goes without saying that everybody wants a very good looking lab. Colours play a vital role here. So, choose colors wisely. If you use common colours, don't expect your lab to look uncommon.