

Tips to Build a Better Lab

Whether this is your first lab, or you've built dozens of them, we hope you'll find these tips and ideas valuable in your approach to designing the best possible lab at the best overall cost. And you'll find that your new lab will be better equipped to accommodate changing laboratory requirements later, especially with cost-effective flexibility solutions like our M-Series, Mobile and Shelving product lines.

1. Plan Thoughtfully

Before you begin, get educated about the process. You need to know...:

- The needs and expectations of functional group managers and other internal team members.
- The expertise and capabilities of your external team, including architects, engineers, construction managers, contractors, and lab planners.
- Your realistic and current needs for space, processes, support areas, and materials storage. Plans made on assumptions mean that you could make costly mistakes. Plans made on projected growth can get expensive very quickly if HVAC, power, and workspace are added prematurely. And the fact is that most well-planned labs can easily accommodate change when needed.

2. Keep Your Layout Simple

- Minimize or eliminate walls between functions.
- Organize functional groups in shared space. It's cheaper to build now and is more flexible later.
- Use islands and peninsulas to maximize your usable space. Putting benches only around the perimeter wastes as much as 75% of your square footage.



3. Establish “Wet Walls”

- Place sinks along walls with existing plumbing services, where possible.
- Keep sinks in close proximity to process and research needs.
- Dedicate a sink for hand washing near the entry/exit of lab.
- Avoid putting sinks on islands or peninsulas. It's harder to install, and costly to reconfigure.

4. Specify 3 ft. and 4 ft. Cabinets and Wall Cases

- A 36” or 48” cabinet only costs 30% more than an 18” or 24” cabinet.
- Using 3’ and 4’ cabinets whenever possible gives you more storage and workspace per linear foot for less money.



5. Choose Open Wall Shelving

- More cost effective per linear foot.
- Can be deeper, taller, and hold more.
- Easily accessible above all workstations.
TIP: Use adjustable height shelving on islands and peninsulas. HLS systems cost about the same as fixed and give users much more flexibility.

6. Simplify and Standardize

- Decide on the appropriate casework configuration for your lab, and then save by repeating throughout your building.
- Hanson systems include fixed steel casework, mobile and flexible furniture options. They work together in unlimited combinations.
- Standardize design with repeated configurations. It looks great, it's cost efficient for architects, contractors, and MEP – and it's flexible in use.

7. Be Smart About MEP

- A good layout plan drives the MEP (Mechanical, Electrical, Plumbing) plan. The MEP plan drives the cost.
- To avoid delays and cost overruns, don't specify power that exceeds current building capacity.
- For wall benches, electric, gases, and data should stay in the wall and off the countertop.
- The less plumbing you do under counter tops after the furniture is installed, the more money you'll save.
- Overhead services are best for peninsulas and islands. Penetrations through the countertop cost money. Why waste it?

LAB PLANNING 101



• Choose the Right Casework

Conventional wisdom says that fixed cabinets cost less, but you sacrifice flexibility. But that's not always the case. Here's the rundown on different kinds of casework, and guidelines on when to use them.

- **Fixed casework** refers to a collection of cabinets joined together to form lab bench walls, islands, and peninsulas.
- **Fixed casework** can be used with adjustable, removable shelving and reagent racks.
- **Fact:** Fixed casework door and drawer combinations can be reconfigured in installed cabinets. At HLS, we can easily accommodate changing needs in response to work group changes, new equipment requirements, or new processes. This is especially true if you choose standard sized components.
- **Application:** Fixed casework is the best combination of cost and benefit for most applications, especially along walls.
- **Modular casework** refers to cabinet systems that can be reconfigured for different needs. Modular casework is a component-based system, with more integral parts than fixed casework, like built in plumbing or electrical. In most cases, modular casework is not attached to floors or walls, and can be professionally re-installed when it's time to make a change.
- **Mobile casework** includes tables, instrument carts, and cabinets that can be moved or reconfigured as needed, often by users themselves. Mobile casework is not affixed to floors or walls. Cabinets, tables, and carts usually have wheeled casters to make moving them easier. Shelves have adjustable heights.
- **Table systems** are the most economical way to add configurability to your lab. A standard four-legged table is the basic building block. Add a flat top, a bottom shelf and caster wheels, and it's perfect for shared equipment. Add suspended or mobile cabinets underneath, and you have a workstation. Place several tables side by side, connect them with a single work surface, top them with adjustable, removable shelving or reagent racks, and you have a bench wall.
- **Fact:** A high percentage of labs designed to be changed are never reconfigured from their original footprint. A high percentage of mobile furniture is never moved once it's loaded with equipment, materials, and supplies. While the idea of a flexible lab is appealing, carefully considering actual needs and working conditions can help you put modular, mobile and flex components only where you'll really need them. And that saves money.

9. Be Smart About Fume Hoods

Fume hoods are the most expensive casework in your lab. There's no doubt that they're costly to operate and maintain. But if you manage fume hoods properly, you'll save money on installation, now and for years to come.

- Consider deeper fume hoods. Our 37" or 41" deep fume hoods have more interior working surface and equipment space, while utilizing the same air requirements as our 31" deep hoods.
- Consider the size of hoods that you'll need: 4' and 5' hoods are about the same cost per unit; 6' and 8' hoods are about the same cost per unit. You'll pay more per linear foot for smaller hoods, so choose larger hoods when you can.
- Include chemical storage safety cabinets in your plans. They make good choices as base cabinets for benchtop hoods.

Variable Air Volume vs. Constant Air Volume?

Variable Air Volume (VAV) Fume Hoods:

- VAV fume hoods are primarily paired with building system controls which are tied into the main building air handling system. VAV systems are used in many newer buildings to save on energy and overall costs.
- As fume hoods are one of the largest consumers of energy, VAV systems will reduce building air exhaust when a hood is not in use, such as after-hours and weekends. This avoids pre-conditioned room air from being exhausted out of the building - which can be costly.
- When a VAV hood is in use, sensors trigger additional exhaust to be used at the fume hood, which also sends a signal to room supply air system to add more air, equal to the amount being exhausted. Over time, the VAV system will provide much greater energy and cost savings over a conventional CAV fume hood.

Constant Air Volume (CAV) Fume Hoods:

- CAV fume hoods are good for small applications, for dedicated exhaust, or for two to four units sharing an exhaust.

- These fume hoods generally have a "constant" rate of exhaust when in use, and are usually less energy efficient. See suggestions below for use of a 2-speed fan.

Hood Location Suggestions:

- Most hoods have "setup" time and "run" time, or are only used on a limited basis. While slightly more expensive to buy, that makes a two-speed exhaust more cost effective in use. Typically, low speed is 50% of high speed. Set the blower on high for setup, low for run-time, or for limited-use purposes.
- Hoods should be in close proximity to one another to save money on installing and maintaining the exhaust system.
- Try to keep fume hoods away from doorways or high traffic areas.
- Keep ceiling supply and return air ducts away from a fume hood as this can cause air flow disturbances and affect the certification process.
- You can also plan for future hoods to be added to the system. But make sure future expansion is identified in the building plan, so that the whole building exhaust and supply can accommodate future needs. For example, you can buy a blower for a 4-hood system when you're only planning to install two hoods at first. Then just block off your "future" duct until you acquire the additional hoods.

Energy Costs Count in Planning for Fume Hoods

- Minimize the negative air requirement in your lab.
- Validate your fume hood requirements carefully. Get your MEP engineer involved early to plan for the entire lab and building needs.
- Don't undercut your needs. The worst thing you can do is run out of air.
- In the past, fume hoods were specified at 100 Linear Feet per Minute (LFM) at full sash open. Current industry standards are now 100 LFM at 18" sash open.
- Check your local codes and internal EH&S requirements before you install your hoods.