

Quick Delivery Lab Furnishings Catalog



Lab Design Guidelines

Working with the **INSTOCK**® Lab Team is Fast and Easy

Using this catalog

Each catalog focuses on a segment of the over 600 commonly used lab furnishing products. This format will help you to locate the products that you need quickly and easily.

Product Organization

Products have been clearly presented using pictures, specifications, descriptive information and performance data to assist with selection.

Next Steps

If you wish to place an order please CONTACTUS@LFSYSTEMS.com or use the Excel Order Form (link) that follows the list of catalogs.
(Note: The order form link requires an Excel Spreadsheet app.)

What's Important for Designing a Lab Space

Your project might involve the renovation of an old lab or building a new one. Our experienced team is ready and available to help lead you through the process. The pages that follow provide an overview of this process. We are looking to help build your information base and to make your interaction with our team more productive.

Part 1 - Understand the space being considered

Survey the area being considered for the laboratory. Think of the overall amount of space that will be required for the people, process and equipment that will occupy the lab. Be careful to ensure that all the necessary utility services and sanitary or chemical drains will be available. If you'll need a fume hood, make sure you review an exit route for ducting. Always consider the future needs of your facility.

Part 2 - Select a Casework Layout

Select a casework layout that best suits your space and complies with established safety guidelines. Please pull our team in as required to help generate some sample layouts.

Part 3 - Outfitting Your Lab

Make a list of all the components your lab will need. Remember to include cabinets, countertops, fixtures, fume hoods, biological safety cabinets, cold rooms, cleanrooms, water purification systems, bench top equipment, refrigerators, seating, etc. One of our Lab Furnishing Specialists will help you complete the project planning, prepare a pricing proposal and be the one point of contact for your project through the installation process.



Laboratory Layout & Design Considerations

Following is a basic set of considerations for general laboratory layout & design. It is not intended to be a comprehensive, but it will be helpful in the review of the needs & requirements for most laboratories. This information will form a sound foundation for the interaction with our lab design team on the layout of furnishings for your lab.

1. Determine the general purpose of each lab, support or work space
 - Number of people
 - Amount of bench required per person or per operation
 - Number of fume hoods or biological safety cabinets needed
2. Confirm the rough lab spaces & sizes needed and their locations within the building
 - Review service runs required
 - Confirm the floor to deck space in the labs
 - Inspect proposed mechanical distribution and passageways
3. Engage your Environmental Health & Safety person as well as Facilities Operations & Maintenance for input
4. Develop a lab equipment listing reflecting the sizes of each piece, service requirements and respective heat loss
 - Confirm if the equipment will fit on the bench or floor. Consider your future operations.
 - All equipment should be placed into a plan view drawing to confirm fit
 - Review overall voltages and total amperage needed for the project
 - Review venting requirements, data connections, and any ancillary equipment needed
5. Examine the proposed lab layout & workflow
 - Confirm that the lab will fit the process
6. Review the need for flexible, open, lab space in the lab layout, consider future needs
7. From a historical perspective, review what's working and not working in the current lab
8. Review specific needs within the lab for:
 - Radioactive or biological materials
 - Hazardous operations
 - ADA compliance
 - Access for rolling equipment
9. Confirm the need for ancillary lab space or other space that makes the rest of the lab work more efficiently:
 - Sample receiving
 - Work in process
 - Glass wash/prep areas
 - Equipment support space
 - Offices or desk spaces
10. Examine lab storage needs
 - Supplies
 - Glassware
 - Chemicals
 - Samples
 - Receiving
11. Review hood selection and distribution in the lab
 - They should be sized to safely fit the purpose
 - Provide access for people, equipment, & process
 - Positioned correctly within the lab
 - Confirm plumbed and wired service needs
 - Confirm the HVAC requirements and the need for both supply and exhaust air systems
12. Confirm the effective separation of lab areas:
 - Lab and Office
 - Higher and Lower areas of hazard or chemical use
 - Sinks & electronics
 - Safety showers & electronics
 - Centrifuges and balances
13. Review needed availability & service distribution in the lab
 - Deck mounted pedestals
 - Wall mounted fittings
 - Overhead service panels
14. Review lab lighting & orientation for effective illumination of the work spaces
15. For sinks, review location, size, purpose & services needed
16. Confirm locations for:
 - Coat racks
 - Safety Glasses
 - Gloves
 - Shoe covers
 - Tack mats
17. Review room air changes needed within the lab and storage spaces
18. Review aisle way clearances
 - Code considerations
 - Passage of equipment
 - Avoid back to back chair arrangements
19. Confirm the placement of all lab safety fixtures and equipment
 - Eye washes
 - Safety showers
 - Fire blankets
20. Review the need for controlled access to the lab and support spaces

Developing Project Goals

Your project timeline could be as little as a few weeks to as much as a few years. We are here to help minimize this process. We can help to formulate a clear understanding of the project goals and navigate normal project pitfalls.

A Project Team Needs to be Selected

The team will need a captain to ensure that the project will run smoothly. The team should consist of the people who understand all elements of the project, from the fundamental design to how it will suit current objectives and future requirements. The team will be responsible for establishing budgets and developing schedules.

The Team Should Include:

1. Facilities Operations and Management - These are the people to help determine if the design meets facility guidelines, maintenance requirements, and available utilities.
2. The Health and Safety Officer at the facility to ensure compliance with site, state and federal safety codes and guidelines
3. Laboratory Management for the lab space
4. Individuals that will be using the lab space
5. One of our Lab Furniture Specialists

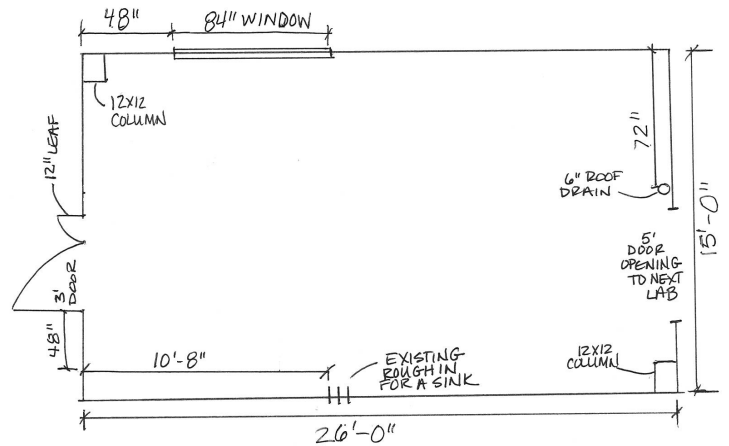
The team captain needs to organize the members and guide them on their contribution to the project. That person will document details, developments, changes, and keep the project on track.



What does your lab space look like?

Measure the room and make a rough drawing

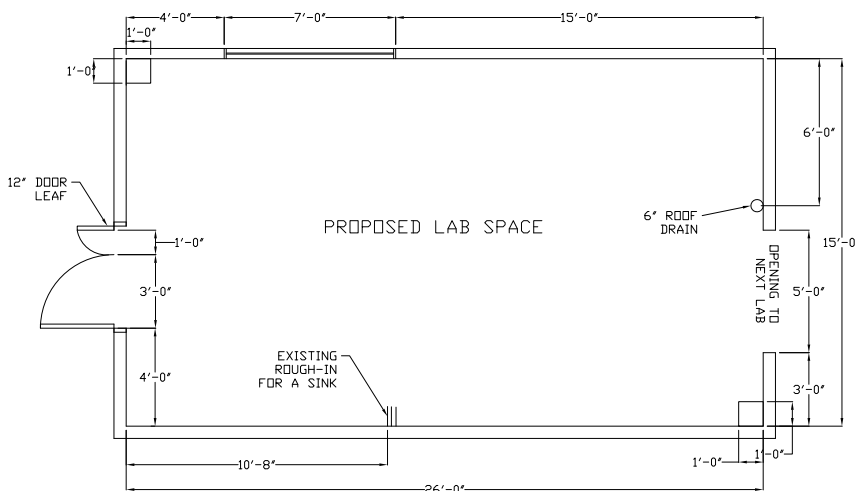
Your lab project starts with an understanding of all room dimensions and details. We can help refine the rough initial details gathered and create an accurate drawing of the space. Pictures of the lab space can help communicate with the project team and keep a record of activity.



Steps

1. Measure all walls and confirm the ceiling height
2. Confirm the sizes and positions of all doors and windows. For the windows it's important to note their height off the floor
3. Measure and mark all:
 - Columns
 - Floor drains
 - Utility connections on the wall or floor
 - Other obstructions within the room

Remember, layers of information will need to be gathered on any project. A member of our CAD team can quickly take a hand sketch and create a scaled drawing for further comment or action.



This initial drawing can now be the basis for planning and further communication. Lab furniture, equipment, electrical, plumbing among other elements can be positioned within the drawing and reviewed by the project team and one of our Furniture Specialists.

Elements of a Safe and Efficient Lab

One of our Lab Furniture Specialists is available to assist with the programming of your lab project.

Work Areas

- Provide adequate space at each bench for equipment to be placed and the process to be performed.
- Provide adequate space within the lab and between each bench for planned and future workflow and required egress and ingress.
- Consider all planned and future free standing lab equipment

Storage and Equipment Areas

- Storage and equipment areas should have appropriate ventilation and be sufficient in size
- All equipment should include a grounded plug. Review any older equipment to be used.

Chemical Storage Areas

- A chemical use assessment should be performed for the project
- Chemical storage should be secure but provide for safe and convenient retrieval
- Provide space adequate for the segregation and ventilation of chemicals
- Separate storage should be provided for flammables, acids, and corrosives

Safety Equipment

- Install eyewash stations within 10 seconds of unobstructed walking time from the location of a hazard
- Install safety showers within 10 seconds of unobstructed walking time from the location of a hazard

Services and Utilities

- A free standing and bench top equipment spreadsheet should be generated. Among other details, this spreadsheet should include information on all services required by equipment item number.
- Consideration should be given to electricity, plumbed and bottled gas, hot and cold water, and drainage required for equipment.
- Consider centralized safety and servicing shutoffs for all utilities
- Consider telephone, data and low voltage systems

Traffic Patterns and Spaces

- All rooms should have at least two forms of egress
- Minimum aisleway clearance is 42"
- Fume hoods should be located away from main traffic aisles or doorways
- Doors should be inset and open outward

Lab Ventilation

- Understand the use of all chemicals and biological elements for the lab space
- Chemical fume hoods require a supply air source and are vented to the exterior of the building
- Ventilation should be considered based upon the procedure or equipment being used
- The equipment listing mentioned in the Services and Utilities section should include the potential heat gain to the lab. This heat gain needs to be considered when sizing the HVAC system for the project
- Lab ventilation should be a minimum of 4 exchanges per hour
- Exhaust fans should be located outside and on the roof of the building

Lab Reference Sources

The references in print as well as the websites listed provide a wealth of detailed information. Whether you are building a new laboratory space or updating an old one, these references will help with developing good laboratory layouts that are safe and are compliant with regulations.

Printed Resources

American Chemical Society, Safety in Academic Chemistry Laboratories

American Chemical Society

This guide is available from the American Chemical Society's Office of Society Services by calling 800-227-5558. (Note: Available free from ACS)

Laboratory Design Handbook

By: E. Crawley Cooper

The Laboratory Design Handbook describes the process, motivation, constraints, challenges, opportunities, and specific design data related to the creation of a modern research laboratory. The information presented is based on a large pool of experience in the development of new and renovated laboratory buildings for universities, teaching hospitals, pharmaceutical companies, start-up biotechnology companies, and other types of industrial technology. CRC Press, ISBN 9780849389962 - CAT# 8996

Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards

Prudent Practices in the Laboratory has served for decades as the standard for chemical laboratory safety practice. Developed by experts from academia and industry, with specialties in such areas as chemical sciences, pollution prevention, and laboratory safety. It provides guidance on planning procedures for the handling, storage, and disposal of chemicals. Designed to promote safety and includes practical information on assessing hazards, managing chemicals, disposing of wastes. National Academies Press, ISBN 0309138647, 9780309138642

Web Resources

Lab Planning

www.labplan.org

This website (the result of a planning study performed by the National Science Foundation) suggests a planning process and offers criteria and standards that can help determine what additional or improved facilities are needed for programs. This interactive website follows the structure of the planning process and provides the tools, guidelines, and data necessary to plan and design high school science, math, and technology education teaching spaces

Americans with Disabilities Act (ADA)

www.ada.gov

Information on the ADA including relevant publications, federal resources, ADA design standards, technical assistance program, enforcements, code certification, business connections, status reports, new and proposed regulations, and the ADA program.

Occupational Safety and Health Organization (OSHA)

www.osha.gov

Complete reference source for OSHA compliance including assistance, grants, cooperative programs, safety and health topics, statistics, US-EU cooperation, and service standards.

National Science Teacher's Association

www.nsta.org

Information provided focuses on the teaching environment, from elementary to college classrooms. Paid membership enables access to journals and books. NSTA recommendations, the latest news, conventions, supplier's guide, and discussion boards.

American National Standards Institute (ANSI)

www.ansi.org

This is a paid membership website that offers documents on laboratory ventilation (Z9.5) for both rooms and fume hoods as well as information on American National Standards including procedures, guides and forms, accreditation requirements, appeals requirements, audit requirements, and governance committees. The site also provides information on IEC programs, regional programs, ISO programs, the standards boards, and panels.

National Science Education Leadership Association

www.nsela.org

This official website of the NSELA is dedicated to providing national leadership in efforts to improve science education. The quarterly newsletter is posted along with operations manuals, by-laws, career postings, and publications.

National Fire Protection Association (NFPA)

www.nfpa.org

Website dedicated to providing research information, public education, professional development as well as fire protection information, and flammable materials storage guidelines. This paid subscriber services offers many of the NFPA codes online.

Scientific Equipment and Furniture Association (SEFA)

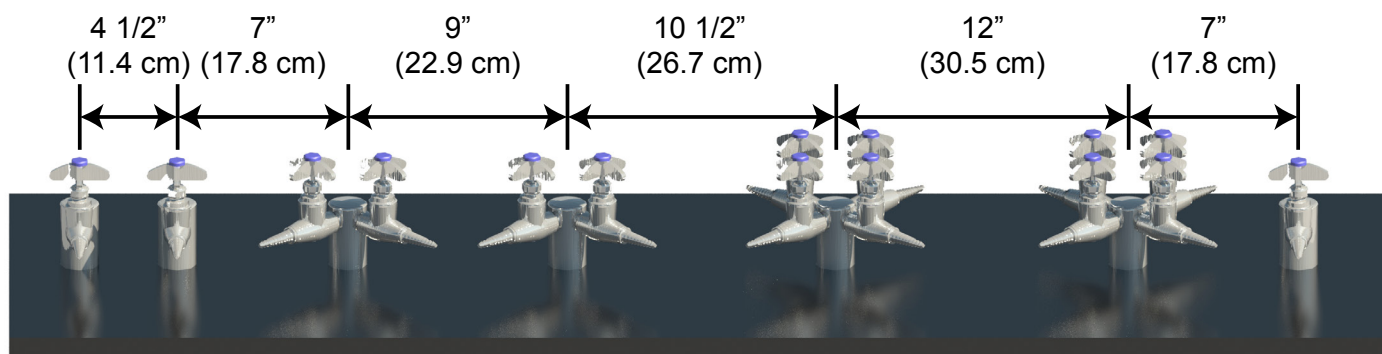
www.sefalabs.com

This official website for SEFA gives paying members guidelines on construction and performance of laboratory equipment and furniture. Links to member companies offering laboratory products and laboratory design are provided.

General Plumbing Details

Minimum Spacing Between Fixtures

The drawing below show the allowable minimum spacing between service fittings on laboratory bench top.



Service and Rough-In Designations and Color Coding

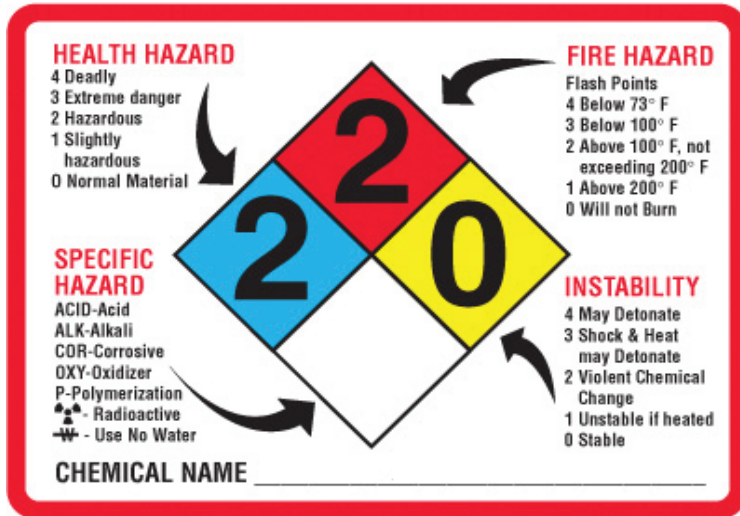
Designation	Service	Color
E	Electric (120 Volt AC)	-
DT	Data	-
A	Air	Orange
G	Gas	Dark Blue
V	Vacuum	Yellow
N	Nitrogen	Brown
O	Oxygen	Light Green
S	Steam	Black
CW	Cold Water	Green
HW	Hot Water	Red
DW	Distilled Water	White
W	Waste	-
WV	Waste Vent	-

Recommended Supply Line Pressures

Service	Pressure
Hot and Cold Water	Local Pressure
Gas	0.216 psi
Air (Ordinary)	15 psi
Air (Air Powered Stirrer Operation)	40 psi
Vacuum (Ordinary)	18-22" of Mercury
Vacuum (High)	28.5" of Mercury
Steam (Low Pressure)	0-15 psi as required
Steam (High Pressure)	15-30 psi as required

NFPA Labeling and NEMA Details

NFPA Chemical Container Labeling



Conversion Chart

To Convert From	To	Multiply By
Milliliters	Ounces	0.03381497
Millimeters	Inches	0.039370079
Ounces	Liters	0.029572702
Liters	Gallons	0.2641794
Pounds	Kilograms	0.45359237
Centimeters	Inches	0.39370079
Cubic Feet	Liters	28.31605
Cu. ft./min.	Liters/sec.	0.4719342
Cu. meters/min.	Liters/min.	999.972
Feet	Centimeters	30.48
Feet/minute	Meters/sec	0.00508
Gallons	Liters	3.785306
Gal./sec	Liters/min.	227.1183
Horsepower	Btu/hr	2547.16
Horsepower	Watts	746
Inches	Centimeters	2.54
Kilograms	Pounds	2.2046226
Kilowatts	Btu/hr	3414.43
Meters/sec	Feet/min.	196.85039
Watts	Btu/hr	3.41443

NEMA Electrical Information

	Receptacle	Plug
120 Volts AC 15 amps	 5-15R	 5-15P
120 Volts AC 20 amps	 5-20R	 5-20P
120 Volts AC 30 amps	 5-30R	 5-30P
250 Volts AC 15 amps	 6-15R	 6-15P
250 Volts AC 20 amps	 6-20R	 6-20P
250 Volts AC 30 amps	 6-30R	 6-30P
120 Volts AC 20 amps Twist Lock Single Circuit	 L5-20R	 L5-20P
120 Volts AC 20 amps Twist Lock Double Circuit	 L14-20R	 L14-20P



Quick Delivery Program

Quick Delivery Lab Furnishings



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