

014219S01 Reference Standards: Laboratory Design Guidelines

Overview: Remodeling and new construction projects offer an outstanding opportunity to improve facilities for current-day research and teaching. One aspect of these improvements is related to safety and health features of the laboratories. This Guideline is provided to help architects/engineers, departmental users and others understand the requirements for new and remodeled University laboratories.

Fire Safety & Building Codes

1. All remodeling and new construction must be reviewed and approved by the University Fire Marshal. Laboratories must be designed for the "moderate hazard" classification according to the Kentucky Building Code and applicable referenced NFPA fire codes (NFPA 45 for campus chemical laboratories and NFPA 99 for hospital chemical laboratories). For laboratories in excess of "moderate
2. Doors
 - Doors opening onto exit corridors must swing with exit egress and must be self-closing and self-latching;
 - Doors within interior partitions shall be self-latching.
3. All door hardware shall meet the requirements for the physically impaired.
4. View panel
 - All doors opening onto the exit corridor and within interior partitions must be provided with view panels;
 - All view panels shall be 3"x33" and shall be 1/4" wire glass in steel frames.
 - All view panels shall be placed directly above the self-latching hardware.
5. Interior partitions more than 6' in height shall be extended to the underside of the structure above.
6. As a minimum, a 5# ABC (all-purpose) fire extinguisher shall be provided adjacent to each door giving access to an exit corridor. Additional units may be required for a particular/specialized hazard(s).
7. Interior and/or windowless laboratories shall be provided with emergency lighting.
8. Aisles/passageways within labs shall be a minimum of 36" of clear and unobstructed width.

Engineering Controls

9. Fume hoods must comply with UK Design Guidelines for Fume Hoods.

10. A master gas shut off valve must be provided for each laboratory or group of labs. The valve should be located outside the laboratory adjacent to the means of egress door of the laboratory and clearly labeled as to its purpose.
11. Safety showers and eyewashes must comply with UK Design Guidelines, and must be installed in every laboratory that has a fume hood.
12. Incorporation of proper ergonomic principles must be provided.
13. Shelves and cabinets must be built of non-porous material; secured to the wall; and shelves must have a front lip.
14. Placement of "supply air" and "exhaust air" vents must be located to avoid short-circuited air movement patterns. Further, in laboratories requiring tremendous volumes of supply air such as laboratories with multiple fume hoods, low velocity air diffusers will be required to avoid turbulence and noise.
15. Canopy hoods are generally not acceptable for contaminant exhaust.
16. Laboratories must be designed to pull air into laboratory from the corridor (negative pressure in relation to rest of the building).
17. Electrical outlets located within six feet of sinks, safety showers, or other sources of water shall be Ground Fault Circuit Interrupter (GFCI) outlets/circuits.

General Considerations

18. Laboratories must include the following signage features:
 - Room Number
 - Sign plate should be large enough to include department name, user name(s), emergency contacts etc.
 - Appropriate precautionary signs (e.g. radiation and biohazard)

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19. Acid corrosive storage should not be located under fume hoods because acids cause significant corrosion to the fume hoods over time. Separate storage must be provided for acids and solvents.
20. Underwriter's laboratory or Factory Mutual approved solvent storage cabinets are required under fume hoods. These cabinets shall be vented.
21. Carpet is not acceptable for chemical, radioactive, biohazard, or animal use laboratories or laboratory support spaces.
22. Designated break areas outside the chemical use laboratory area are required. At a minimum, a work desk/ break area should be separated from the laboratory work area by a non-combustible transparent barrier to isolate the workers from exposure to hazards.
23. High use radioactive materials labs may require special engineering and facility features (e.g. HEPA filters, seamless flooring, stainless steel bench tops). Such laboratories must be approved by the UK Radiation Safety Officer.

Special Use Laboratories

24. Biological Level 3 laboratories require extensive engineering and architectural features and will be reviewed and approved by the UK Biological Safety Officer and the Institutional Biosafety Committee.

Approved by UK Design Guidelines & Technical Standards Committee June 18, 1998.