

The formulae  $\frac{\partial \rho U_i}{\partial t} + \frac{\partial}{\partial x_j} (\rho U_j U_i) - \frac{\partial \tau_{ij}}{\partial x_j} + \frac{\partial}{\partial x_j} \left( \mu \frac{\partial U_i}{\partial x_j} \right) + g_i (\rho - \rho_0)$  for building  $\frac{\partial}{\partial x_j} (\rho U_j H) - \frac{\partial \tau_{ij}}{\partial x_j} + \frac{\partial}{\partial x_j} \left( \mu \frac{\partial U_i}{\partial x_j} - \rho \overline{u_i' u_j'} \right) + g_i (\rho - \rho_0)$  state of the art  $\frac{\partial}{\partial x_j} (\rho U_j H) - \frac{\partial \tau_{ij}}{\partial x_j} + \frac{\partial}{\partial x_j} \left( \mu \frac{\partial U_i}{\partial x_j} - \rho \overline{u_i' u_j'} \right)$  biomedical research facilities.

## Vision Panels in Laboratory Doors

As a rule laboratory doors should remain closed: a basic requirement of Biosafety in Microbiology and Biomedical Laboratories (BMBL) is that laboratory doors have closers and be kept closed to maintain air pressurization and containment<sup>1</sup>. Additionally, self-closing doors are a requirement in fire-rated corridors. Labs are also hazardous places, so visual connections from corridors and between labs enhances safety. In order to address both BMBL and safety requirements the DRM Chapter 4, Sections 4.2.2.8 *Laboratory Door Glazing*, 4.2.3.8, *Animal Research facility Door Glazing* and 4.9.3.2, *Interior Doors*, require that all laboratory doors have vision panels.

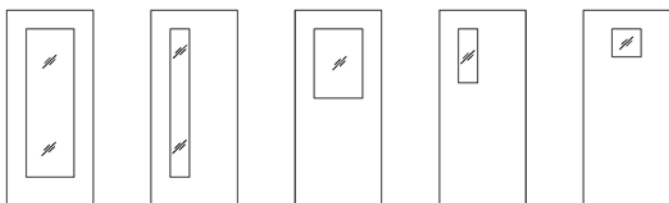


Figure 1: Typical vision panel configurations.

Vision panels in doors accomplish a number of important functions:

- The interior of a laboratory can be observed without opening the door. This allows an event in the lab to be seen that would otherwise be unnoticed.
- In the occurrence of an event, people outside of the lab can observe the conditions and assess the risks before entering the lab.
- Vision panels allow people entering and exiting the lab to see a person on the other side of the door, reducing the potential of being hit by a swinging door, which is a particular concern in small labs and narrow corridors.
- In the case of anterooms and vestibules, vision panels allow people to see into the vestibule and anticipate when doors can be opened.
- Vision panes are a way of bringing borrowed light into interior spaces and creating a sense of openness. Vision panels are less expensive and use less wall space than sidelights, transoms or other glazing options.

Vision panels can be in a number of sizes and configurations, depending on their purpose and function (figure 1). Small panels can be used if quick observation is needed. Larger panels can be used for greater observation or for borrowed light. Vision panel size and configuration should be selected based on a number of considerations, including:

Doors design, including vision panel size and detailing, should match building standard if possible, especially if the door is in a public corridor lined with similar doors.

Large vision panels can provide an expansive view into the lab. This can visually connect related labs, and can be part of a tour or inspection route where lab functions are observed without entering the lab.

- Small vision panels are easier to fit with light-control covers and colored light filters.
- The entire door assembly, including the vision panels, must be appropriately UL rated for the wall in which it is installed.

The door and vision panel must be compatible with the function of the laboratory that it serves. Considerations include:

- Laboratories requiring blacked-out or light-controlled conditions should be fitted with hinged or sliding light-tight covers (figure 2). It should be noted that optical labs, microscope rooms and other light-sensitive labs can benefit from having vision panels during set-up and other non-operational times, and use the covers for light control during sensitive operations.
- In addition to covers, vision panels can be installed with a red filter of the appropriate wavelength to control lighting for animal holding rooms with diurnal lighting systems.
- Specialty doors with vision panels are available for radio frequency (RF) and x-ray shielding, ballistic and blast resistant and many other specialty applications.
- The vision panels in high-traffic areas should be sized to allow for door protection plates and rails.



Figure 2: Light-tight cover on lab door.

There may be very specialized condition or laboratory functions that the laboratory designers think may be incompatible with vision panels. In this case DTR, DOHS and other appropriate offices should be contacted to review the specific conditions and requirements. If no special conditions exist it is incumbent to the lab to determine the best vision panel configuration.

Reference:

- <sup>1</sup> Biosafety in Microbiology and Biomedical Laboratories, <https://www.cdc.gov/biosafety/publications/bmb15/bmb1.pdf>

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Further details on this month's topic are available on the DRM website DRM Chapter 4 Architectural Design

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