

### Standardized Labeling

Eventually, designers will be able to answer questions such as these by referring to some form of standard labeling for materials used in the products they choose. Such labels will likely be required by law, much as they are now required for food. A number of such systems are now in use in Europe. In this country, however, standard labeling is in its infancy. Material data sheets are only partly useful. Small amounts of materials are not required to be reported, nor are compounds used in the production process itself. In the meantime, designers will have to ask these questions themselves. Researching the life history of each material and product in a project generally is not possible within the normal pressures of schedule and fees. Fortunately, there are growing lists of resources that can help designers understand these issues and assist them in making timely decisions.

**FIGURE 16-7**  
Common Substances to  
Avoid when Selecting  
Materials.

VOLATILE ORGANIC COMPOUNDS (VOCs)		HEAVY METALS (AND THEIR COMPOUNDS)
<input type="checkbox"/> Formaldehyde	<input type="checkbox"/> Isophorone	<input type="checkbox"/> Lead
<input type="checkbox"/> Vinyl chloride	<input type="checkbox"/> Methylene chloride	<input type="checkbox"/> Mercury
<input type="checkbox"/> 4-phenylcyclohexene (4-PC)	<input type="checkbox"/> Ethylbenzene	<input type="checkbox"/> Cadmium
<input type="checkbox"/> Styrene	<input type="checkbox"/> Naphthalene	<input type="checkbox"/> Chromium
<input type="checkbox"/> Benzene	<input type="checkbox"/> Phthalate esters	<input type="checkbox"/> Antimony
<input type="checkbox"/> Methyl ethyl ketone	<input type="checkbox"/> Acrolein	<input type="checkbox"/> Nickel
<input type="checkbox"/> Methyl isobutyl ketone	<input type="checkbox"/> Acrylonitrile	
<input type="checkbox"/> Toluene	<input type="checkbox"/> 1,2-dichlorobenzene	
<input type="checkbox"/> Xylenes	<input type="checkbox"/> Acetone	
<input type="checkbox"/> 1,1,1-trichloroethane	<input type="checkbox"/> Carbon tetrachloride	
<input type="checkbox"/> Trichloroethylene	<input type="checkbox"/> Tetrachloroethane	

## INDOOR ENVIRONMENTAL QUALITY AND THE DESIGN PROCESS

# Designers need to consider

Designers need to consider numerous factors when they set out to create an indoor environment. Important factors include the quality of the air, lighting, acoustics, thermal comfort, and visual and actual access to the outside. In designing a new or renovated facility, design professionals should understand not only the individual environmental impacts of each material deci-

**FIGURE 16-8**  
In this laboratory,  
daylight is the main  
source of light for most  
of the day.



sion but also the total impact of these decisions in creating environments that support the building's users.

The design of systems to increase natural light is a good example of how designers can satisfy the user's interior environmental needs and exterior environmental needs at the same time. In the United States, cheap energy after World War II allowed the creation of large hermetically sealed buildings which cut most occupants off from the outside world. Windows no longer opened, and fewer and fewer people ever saw outside. Fresh air was limited in the name of "energy conservation." Increasingly, these kinds of buildings have been questioned from a humanistic as well as an environmental and health viewpoint. In Europe, for example, basic access to daylight is commonly required in many building codes. Many require all building occupants to be within a maximum distance (25 ft) from an outside window. Operable windows are common and also frequently required. In addition to being more pleasant places in which to work, these buildings typically use substan-