

Fixed and Flexible Lab Bench Considerations

Overview

The March Technical Bulletin outlined the benefits and some of the options for designing flexibility into laboratory benches. Flexibility is a desirable attribute, but flexibility in benchwork comes with operational and financial tradeoffs which must be understood. The degree of flexibility should be assessed for each application and selected accordingly. This issue will outline some of the advantages and disadvantages of flexible benches.

Flexible System Advantages

Flexible systems provide a number of very useful features not available with traditional fixed benches, including:

Benchtop height adjustability: Most flexible bench systems allow the height of the benchtop to be adjusted from 30" to 36". This adjustability allows individual section of benchtops to be at a specific height required for ABA/ADA compliance (typically 34"), the comfort for an individual researcher, or ideal height for a specific piece of equipment or process. A growing concern is repetitive stress issues facing employees, which can be addressed by providing a wider range of benchtop heights. Flexible bench systems allow benchtop heights to be adjusted with minimal effort.

Bench reconfiguration: Flexible bench systems consist of standard lengths of a table-like frame system on which a benchtop, undercounter cabinets and shelves are connected. Cabinets and shelves can be added or removed, and entire bench section added or removed usually with minor effort, providing layout flexibility, and allowing a lab to be reconfigured as required to meet evolving needs.

Fixed and Flexible System Comparison

Flexible features are associated with a number of limitations which should be weighed against the advantages, to determine the optional system for a particular situation. Items to consider include:

Cost: The first cost of flexible systems is generally significantly higher than standard fixed benchwork. Flexible systems also utilize proprietary components, so parts and service must be obtained from a single supplier, with potential cost implications. The cost of modifying fixed benchwork is very high, however, and can raise the life cycle cost of fixed casework until it meets or exceeds that of flexible systems. Another consideration is that flexible systems may be defined as furniture, as opposed to building components, which may influence depreciation and funding sources.

Storage Efficiency: Standard fixed benches provide a more efficient use of storage space than flexible systems. Flexible systems incorporate frames, guides, adjustment clearances and other aspects of adjustability which reduce efficiency.

Durability: Flexible systems are designed with components which move, which introduces a level of wear to componentry that is not in traditional fixed benchwork.

Stability: Fixed benchwork is immobile and benchtops are large sheets of heavy material (typically epoxy or phenolic resin), anchored to both the casework and the wall. This assembly provides a very stable platform for sensitive work. Flexible systems are supported on locking wheels or floor guides, and are not anchored to the floor or wall, resulting in an assembly that can be unstable. In addition, 'C' frames and cantilevered system can flex under heavy loading.



Figure 1

With backsplashes and sidesplashes, a fixed benchtop provides an ideal continuous surface for working with chemicals and liquids (Figure 1). Flexible systems have individual 5' or 6' benchtop sections, with joints between and around the sections (Figure 2). According to DRM requirements, all benchtop joints must be sealed, presenting a problem for flexible casework.

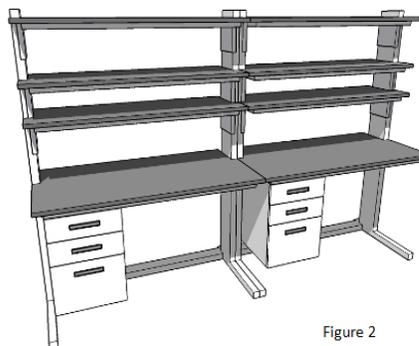


Figure 2

characteristics are most useful, including wet areas, areas requiring heavy loading and stable work platforms, and areas not likely to change function. Install flexible benches in 'dry' areas, areas of lighter duty, and areas likely to be reconfigured.

Seamless Tops: Fixed benches are typically fitted with epoxy or phenolic benchtops. Benchtops are available in 10' or 12' sections, and sections are mechanically fastened and chemically sealed to create benchtops of any length desirable.

Conclusion

The degree of flexibility should be assessed for each application and selected accordingly. One strategy is to install fixed benches in areas where their

For further reading:

Research Laboratory, Whole Building Design Guide,

http://www.wbdg.org/design/research_lab.php

Trends in Laboratory Design, Whole Building Design Guide,

<http://www.wbdg.org/resources/labtrends.php>