

Laboratory Furniture & Planning Solutions

Planning a laboratory with hygiene in mind

Pippa Lain-Smith, on behalf of Teknomek Ltd

Whether you are planning a new laboratory from scratch or reconfiguring an existing lab space, if you are not starting the design process with hygiene at the forefront of your mind, you are opening your business up to increased risk of contamination and, therefore, increased risk to your productivity and profitability.

Your laboratory may look clean at first glance, but bacteria have a nasty habit of hiding in plain sight. If your lab space, and the furniture within it, is poorly planned, designed, constructed and managed, there are a plethora of problem areas where microbes can lurk, multiply and spread at an alarming rate. Dangerous dirt traps and hard to reach areas can quickly become a major hygiene and compliance hazard.

By planning a laboratory with hygiene in mind you can speed up your cleaning regime, make your production process more efficient and, most importantly, reduce the risk of contamination and potential shut down, explained Michelle Locke, Product and Marketing Manager of hygienic furniture specialists Teknomek.

Let's start at the beginning

Designing and fitting out a brand new laboratory space to meet the particular needs of a project or business demands a great deal of research and planning. There are many questions to ask. For example, what is the fundamental purpose of the space you are designing? Is this purpose likely to change in the short or medium term as your business changes and adapts to the commercial environment? How many people will be working in the space at any one time and how many workstations will be needed? What equipment will be housed within the laboratory and does that equipment present any particular challenges? Is there a clearly defined workflow between the workstations and equipment and is this likely to evolve over time?

And these questions are just the tip of the information-gathering iceberg. You'll also need to consider potential health and safety issues connected to the room and equipment being used, such as COSHH, radiation, electrical equipment, lifting or heavy handling.

If you are reconfiguring or redeveloping an existing laboratory, you'll need to carefully assess what existing furniture can be re-purposed, bearing in mind that not all furniture is designed to have a long life. If you are considering holding on to a seemingly useful piece of lab furniture, ensure you look at it from every angle. If stainless steel, can you spot any areas of corrosion or rouging that will make it difficult to keep clean? If the furniture has a Trespa or Sealwise surface, ensure that its edges are still perfectly sealed and it has experienced no wear and tear that could provide a bacteria hazard.

Key to this is the input of your in-house experts: your cleaning team. As specialists in their field, consult with them to identify potential problem areas.

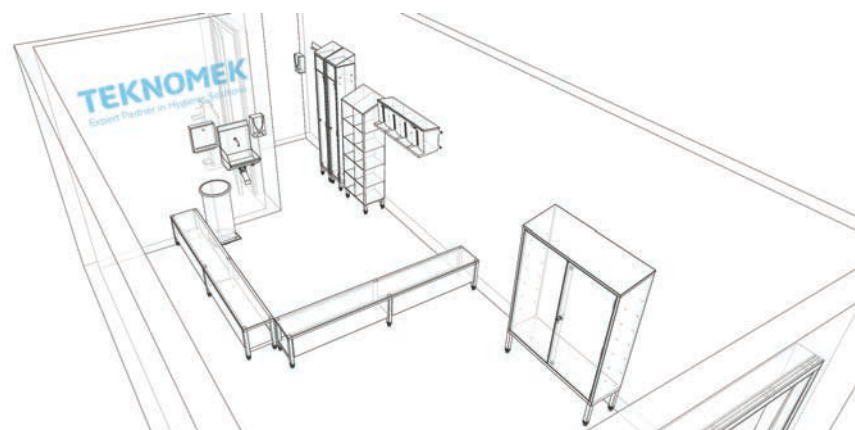
Make the grade

All furniture and equipment specified for use in a laboratory must facilitate Good Manufacturing Practice (GMP). It must be chemically inert and robust enough to withstand even the harshest of cleaning regimes and regular maintenance. Because hygiene is the overriding concern in any laboratory, you need to consider what method of sterilisation will be used before you specify your furniture to ensure it is perfect for purpose.

304 grade stainless steel is overwhelmingly the standard material of choice for use in laboratories because it is so robust. It is also flexible enough for bespoke designs. 316 grade stainless steel goes one step further. With the addition of molybdenum, it can withstand the most vigorous cleaning routines and sterilisation processes without corroding.

As well as its hardness, the composition of stainless steel has intrinsic hygienic qualities. 304 and 316 grades are austenitic stainless steels, these have no pores or cracks within which microorganisms could gain a foothold - or perhaps a flagellum hold. It is also essentially inert to most acids and alkali, which eliminates any risk of pitting or crevice corrosion.

Stainless steel is also very easy to keep clean, it is often likened to glass or china



and tests conducted with commercial detergents have shown that around 97% of contaminants are eliminated from austenitic stainless steel surfaces.

My laboratory has an excellent HVAC system; so of course it's hygienic

Humans are the single biggest risk to hygiene in laboratories. As a rule, we shed 10 grams of skin every day. Effective gowning does reduce the amount of skin fragments escaping into the laboratory atmosphere, but it will only go so far. Bacteria breeding particles will break free, and this is where effective ventilation can help reduce the risk of contamination.

If you have a ventilation system in your lab, you may well be controlling your air particle count. But whilst your HVAC system can be an effective partner in reducing particles in your lab space, you need to take into account other factors too.

The direction of air travel influences the ability of particles to settle. So, at design stage, it is vital to consider where vents are placed in relation to usage and the furniture. How does the layout and positioning of furniture hinder airflow and increase your risk?

Once installed, ventilation systems are often prohibitively expensive to change, which can make moving furniture and equipment a pragmatic solution in context of workflow and H&S considerations. It's not just larger pieces of furniture, but smaller items too. Even a small cupboard with a solid back and positioned close to a vent can have a significant impact on air flow and create a still air point, enabling viruses, bacteria and spores to settle. A heavy duty table is most frequently a solid surface. By ensuring it has open sides you again have a positive impact on air flow and reduce risk. A second shelf below should ideally not be solid. Instead, opting for a series of bars instead of a solid shelf will allow maximum air flow and enables particles to move freely. Even chairs with solid backs can create blockages or still areas if poorly sited in relation to vents.

And just as a piece of furniture can cause a dead air area within a lab, so can a human. Consider where your people are going to be working. If a person is situated in the wrong place for an extended period of time, it can cause air flow blockages and affect the hygiene of your lab. At planning stage, when assessing your layout, factor in where people will be working in relation to HVAC vents and seek specialist advice on where best to place your furniture to ensure airflow is not compromised.

When planning how your laboratory will be used, take time to accurately predict where the windbreaks will be and how they can be mitigated. By taking time to consider what will stop and block air flow and prevent air particles from being effectively removed by your ventilation system, risk can be managed.

Is my existing furniture hygienic?

The only way to be absolutely sure that your furniture is hygienic is to take an extremely close look. Run a clean cloth over hidden surfaces to check for dirt. Check your laboratory furniture for concealed ledges, ridges and inaccessible corners. Seemingly innocuous shelves and edges can form potentially dangerous harbourage points for objectional organisms which, in the right conditions, can quickly multiply. As previously mentioned, your cleaning staff are the experts here. Consult them to find out which areas in a lab are hard to reach and are known to cause problems.

If you decide to opt for fixed furniture or pieces that are not easily moveable, ensure there is sufficient space beneath the floor and the base of the unit for easy cleaning access. Similarly, ensure there is space around the sides and that the top of higher units can be easily and safely reached. The more 'hard to reach' areas you have in your lab, the more likely it is that hygiene will be compromised.

To make labs easier to keep clean, opt for storage with sloping ledges where possible. This way, cleaning fluids can less easily pool on the surface, not only making them easier to clean but also reducing the likelihood of corrosion. If you need storage space within the laboratory, consider closed cupboards to reduce the risk of dust gathering.

For any large, hero pieces of equipment in your laboratory, consider fitting a removable case around it so it's easy to clean.

Consider mobile furniture to make it easier to carry out deep cleans and access all areas. Mobile and modular furniture which can be easily moved around to free up space, can make the clean down process for walls and floors much quicker, reducing lost time as well as providing flexibility in terms of working environment and project management.

The smooth operation and productivity of your laboratories is important. But maintaining a hygienic and risk free environment is absolutely critical. By putting hygiene right at the top of your priority list at the very start of the laboratory planning process, you can avoid many pain points further down the line.

www.teknomek.co.uk



Read, Share and Comment on this Article, visit: www.labmate-online.com/article