Laboratory installation by design – making the impossible easy

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Three easily maintained and very accessible front loading, high capacity Priorclave autoclaves installed at the Royal London Hospital, Whitechapel, London, UK.

When planning and designing a laboratory the task of positioning or repositioning equipment like a laboratory autoclave can be at either end of the 'easy-impossible' scale.

While bench top autoclaves and those with a small footprint usually present fewer problems there is often a temptation with larger models to fit a quart into a pint pot. So, why worry?

For one thing it is not unknown for some manufacturers to leave their equipment at the bottom of the stairs if there is not an easy way in – leaving the problem of getting it into position down to you.

Planning also saves you having to dig up your brand new laboratory floor to install the necessary drains.

Many autoclaves are squeezed into the corner of the laboratory corner working in splendid isolation – until they stop! By then it is a little late to discover, as your laboratory is grinding to a halt, that service engineers do not fit into a 50mm gap!

When adapting older buildings access and drainage is a problem that has to be addressed when inspecting the premises before buying or committing to a lease or rental.

With brand new buildings architects need to be told in advance of the requirements for large, heavy pieces of laboratory equipment such as autoclaves so they can design them into the layout, structure and technical services.

It is often the case that little thought is given to the services and space required for the installation of such equipment or to the removal of equipment with a shorter lifespan than the building.

The modern autoclave with venting and vacuum systems and the need to address possible bio-hazards means that the planning of an autoclave position must now consider drainage, water supplies, venting and air supply.

When it comes to positioning and installation, some key questions to ask include the following:

- Can you get the autoclave into the suggested location via any steps, corridors, tight corners and doors?
- If on an upper floor, is a suitable lift available?
- Will there be enough space around it for service access?
- Is access to a drain available and if so is the drain vented?
- Will the drainpipes and joints stand the temperature of the exhaust from the autoclave?
- Room size. Just how much space do you really have? For a cabinet type autoclave you should ideally allow the following:
  - To the sides: 1m.
  - To the rear: 300mm.
  - To the front: 2m or twice the length of any loading trolley.
- Will heat extraction be required, especially if installation is planned in a separate small autoclave room?

Any reputable supplier will be able to provide assistance, advice and information on these factors. Often you will be able to arrange a site survey to make sure that everything is going to fit.

What services do you have or need and how do they match up with the manufacturer's requirements? These may include:

- Electrical supply – 415 volt 3 phase or 240 volt single phase and how many amps?
- Water – will mains water be okay or will treated (softened or RO) water be required? Is the supply pressure sufficient?
- Drains – are they heat resistant?

Drains should withstand steam up to 140°C. Domestic plastic waste pipes will melt if connected to an autoclave and on some other systems, although the pipes are temperature resistant, the joints can be affected over time. This can be overcome by cooling the autoclave exhaust but is better arranged at the time of manufacture rather than after a costly leak.

- Are they big enough?
- Are they vented at a high level outside of the building?
- Is a separate drain for overflows and drip trays required?
- If steam is required should it be plant steam or clean steam?
- Is the line pressure acceptable and is the steam dry enough?
- If compressed air is required, is there sufficient pressure and capacity?

A problem with any of these issues is not necessarily the end of the world; by talking to the autoclave supplier or manufacturer early in the planning process most issues can be quite easily overcome. ■

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