



INCUBATOR / OVEN / FURNACE – SELECTION GUIDE

To assist you in choosing the right incubator/oven/furnace for your application, we have put together this guide. By following the steps below, selecting the best piece of equipment for your application should be made easier.

STEP 1: What is the maximum operating temperature required?

The maximum operating temperature of the apparatus determines what type of equipment will best suit your application. In general:

- **Incubators** operate up to 80°C
- **Ovens** operate up to 500°C
- **Furnaces** operate to temperatures above 500°C to 1800°C

It should be noted that while these temperature ranges represent the maximum recommended operating temperature for Labec equipment, they are somewhat conservative. This means that although an oven may have a maximum operating temperature of 300°C, it can operate at this temperature for extended periods of time.

STEP 2: Size and Capacity

Two important factors in choosing an appropriate oven or furnace are its size and capacity.

- While it may seem very obvious, you should take into account and space restrictions in your workplace.
- Decide on the maximum sample size and the amount of materials that you want to heat at any one time to decide what capacity oven or furnace is most suited to your application. As a general rule, ovens work best when less than 50% full. To make this easy, we have provided both external, internal and chamber capacities for our entire ranges of incubator, ovens and furnaces. We can also produce custom sizes on request.

STEP 3: Operation / Performance

Do you require rapid heating and high degrees of temperature uniformity? If so, you should choose an oven with fan forced heating. These types of ovens can heat faster than models without fan forced heating. The flow of heated air also improves recovery times (e.g. after opening the door), increased temperature uniformity across the chamber and provides better ventilation.

While fan forced heating is not available on our range of furnaces, we do offer a muffle furnaces with increased air flow for ashing or organic materials. If atmosphere control is important and operating temperatures above 500°C are required, a tube furnace may be the solution. These can be made multi-zoned to produce specific temperature gradients and can be easily adapted to controlled atmosphere applications (e.g. flowing gases).

Remember, the placing of samples within an oven or incubator can affect the temperature uniformity within the chamber, and sometimes event the temperature gradient through the samples.





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STEP 4: Control System and Data Collection

Do you require simple or complex heating schedules or do you just need your piece of equipment to maintain a constant temperature. All of our equipment use PID microprocessor controllers, however on some of our ovens we can provide controllers that simply maintain a given temperature, or others that can heat up to given temperature via a series of ramps and dwells. Some of the more sophisticated controllers use complex PID algorithms to control the temperature and can follow programmed heating schedules very accurately.

We can also equip most pieces of equipment with chart recorders so that you can check how the temperature varies according to your process without actually having to be there. Alternatively, some controllers can be hooked up to RS232/RS485 ports, so that they can be connected directly to a data logger or computer to collect this information.

STEP 5: Special Requirements

While we have endeavoured to construct the interior linings of our ovens and incubators out of stainless steel to make cleaning easy and the interiors resistant to chemical attack, it may not always be the solution for all situations. For this reason, you should always let us know what you are intending to put in the oven or incubator before purchasing in case your process require any special construction materials.

Furnace linings are made from high alumina compositions, which are generally inert and hard wearing, although may be susceptible to chemical attack from certain species. Again, you should let us know what you are going to be heating in your furnace before purchasing to ensure you are getting the best furnace for your application.

When dealing with the heating of materials that produce vapours (e.g. water vapour etc), it may be an advantage to fit an exhaust fan to remove these gases more efficiently. You may also need to make arrangements for during these gases out of your laboratory or locating the oven in a fume cupboard.

STEP 6: Options

After having chosen the right piece of equipment for your application, the addition of some options may make it more functional for your application, e.g:

- Extra shelves, especially if you are working with a large number of smaller samples.
- Viewing windows, useful for checking the progress of a process without upsetting the temperature within the chamber.
- Lights, for applications requiring UV or day night simulation.

STEP 7: Ordering

Now that you've decided exactly what you want, simply contact us by using the details below to obtain a quote or discuss any queries you may have.



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