

## SELECTING THE RIGHT LABORATORY OVEN GUIDE:

Crucial to achieving uniform temperature throughout heating procedures, Lab ovens are used for performing a wide range of high forced convection applications. Regarded as a common daily lab instrument, it is no surprise that lab ovens are widely spread across industries.

While several manufacturers today offer a wide selection of lab ovens, each are designed with a number of options and functions to meet different heating requirements. Determining which one can best suit your heating applications may not be a simple decision to make.

As industry leaders in equipment distribution, Laboratory App is here to break down 4 of the most important considerations when purchasing your next lab ovens. Read on and learn more about an oven's different types, capacity range, design features, and other options that can enhance your daily lab workflow.

### 1. Select the Right Laboratory Oven for your Application Areas.

A vital step in determining the appropriate oven type is to define your application areas. Generally, oven types depend on your intended use. Oven types are mainly classified into vacuum ovens, gravity convection, and mechanical convection ovens. Each providing specific heat distribution properties and temperature uniformity for different application needs.

Below is a rundown of the various lab oven types and their application areas:

**Vacuum Ovens** are best for samples that do not require convection of air. Commonly used for delicate drying procedures, vacuum ovens are also best for moisture determination, outgassing solids, plating, aging tests, chemical resistance studies, drying of paper, rubber and textiles, desiccating, dry sterilization vacuum storage, and electronic process control.

When dealing with these types of application that requires inert atmosphere, the Lab Companion's OV-12 or Lab Companion OV-11 vacuum ovens come recommended.

**Mechanical Convection Ovens** often referred to as forced convections, are mainly designed for applications that require precise-temperature uniformity and faster heating time. Equipped with a motorized fan, this type of oven forces heat movement within the oven allowing a more consistent distribution of air to produce even heating. Moreover, Forced-air convection ovens are best for applications that require a level accuracy, multiple samples, and high moisture contents.

Mechanical ovens can be used for general heating applications like general baking, heating, and drying glassware, rubber, paper, textile. They can also be used for complex heating procedures such as asphalt testing, conditioning, digestion of proteins and starches, drug metabolism, Electronic Burn in, Epoxy and Plastic Curing, Serum Protein

Analysis, Stability and QC batch testing, Sterilization, Suspended Solids Evaluation, and Vulcanization studies.

Interested in forced convection ovens? Take a look at the selection of mechanical ovens available in programmable, economical, and general: Lab Companion OF3, Lab Companion OF-22G, Lab Companion OF-22P, Lab Companion OF-11E, or Lab Companion OF-02G-4C.

Another mechanical convection oven designed to be cleanroom-compliant are **Clean Room Ovens**. These ovens can be equipped with HEPA filters that meet class 100 air standards which makes it great for electronic parts curing, semiconductor chip cleaning, and wafer baking. If you need clean room ovens incorporated with HEPA filters, take a look at Lab Companion OFC-20HP or Lab Companion OFC-20H.

**Hybridization Ovens** such as HO-10 Hybridization Oven are used in molecular biology labs, research and labs where identification of protein, DNA, and RNA is present.

Alternative to mechanical convections, **Gravity Convection Ovens** rely on natural circulation of air during the heating process. If temperature uniformity is not necessary to your applications such as drying of plant tissue or fine chemical precipitation, consider looking for these products Lab Companion ON 22G, Lab Companion ON-02G, Lab Companion ON-12G or Lab Companion ON-11E

## 2. Select the Right Temperature Range

Another important consideration to look into is the temperature capacity you require from your oven. Having a better understanding on how much capacity you need for your applications can help you avoid paying too much for what you don't need.

Depending on the model, a standard oven has a set of temperature from ambient above to maximum 200C to 300C. But if your applications require a much higher range than this, select a high temperature oven which are capable of handling temperature up to 400C to 600C.

Ideally, look for a model with a maximum temperature capacity higher than what your application requires. This would give you more flexibility when handling different test and ensure greater accuracy & uniformity during routine procedures.

## 3. Decide on Design and Construction

Now that you have identified which oven type and oven capacity suits your application, here are the other things you need to consider when it comes to the design and construction of your oven.

### **Laboratory Oven Size**

Depending on your space allotment and sample size, different oven sizes are made available from benchtop models up to free standing units. When selecting the oven size, ensure enough space is still available for you to carefully navigate through the facility.

Note that when comparing lab ovens, it is ideal to compare internal dimensions rather than the stated liquid capacity. This is to avoid being misled by manufacturers who describes internal litre capacity differently. Some would state the total internal volume while others refer to theoretical available volume.

For facilities that require large volumes of small samples, opt for multiple smaller ovens or you can also invest in multi-chamber ovens like Lab Companion OF-02G-4C or Lab Companion OF-02G-2C. These units offer cost-effective solution for labs with limited space and budget.

### **Aluminum or Stainless Steel**

Several laboratory ovens have been designed to resist corrosion and deterioration with stainless steel interiors and shelves. If you are more likely to handle samples that leads to corrosion, Opt for lab ovens like Lab Companion OF3-45HP. Otherwise, consider ovens with aluminum interior as an economical option for samples that are not particularly corrosive.

### **Temperature Control and Display Options**

Many ovens feature controllers ranging from simple analog dial controllers to high-accuracy programmable digital models.

Ovens with analog controllers use numbered dials and dial thermometer to set and display actual temperature. Analog controlled ovens are best for facilities that perform simple heating functions.

Alternatively, ovens with digital controllers set and display the temperature through digital LCD controllers. These ovens come recommended for facilities that highly require precise temperature control and uniformity. Lab Companion's OF-12P, OF-22G, and ON-22G are some of the few models that feature Microprocessor PID controls.

## **4. Additional Features Options**

Aside from oven type, capacity, and design & construction options, It is worth taking a look at the available oven features that might actually help improve your daily workflow activities. Below we have listed additional tips you can look for in your oven.

**Timer**

Oven models built with timers are best for short-staffed facilities. You can check out Jeio tech's collection of lab ovens that feature dual wait timers such as Lab Companion OF-22P and Lab Companion OF3-75P

**Data Logging Capabilities**

Some laboratory ovens offer data logging capabilities to provide users a more consistent production of result. Ovens equipped with data logs present you the option to measure temperature profiles during routine procedures. This enables users to save process values, setpoints, alarms. This feature can also help you improve or make any corrections to a process.

**Additional Shelves**

Check the oven's number of shelves provided and the number of possible shelf positions if additional shelves maybe needed.

**Safety Features**

Here are some of the safety features to look for an oven:

- Ensure that laboratory ovens have Keypad lock function to avoid accidental changes during routine procedures.
- Opt for audible and visible door alarms
- Find an oven that automatically runs after power interruption

Don't let a long list of features distract you from getting what you actually need. Remember to balance out the cost of the features with the actual benefits you need. If you have worked out a budget and are looking for brand new lab ovens, check out [Lab.Equipment's](#) laboratory ovens.

For any assistance needed on potential laboratory oven purchase, feel free to reach us at **1-888-699-7245** or email us at [john@laboratoryapp.com](mailto:john@laboratoryapp.com) today.