

# TIPS ON SELECTING A BURNER

Application Note

With so many variations in applications and increased complexity of processes, selecting the right burner can be a challenge. And while difficult, choosing the right burner is critical in preventing down time and saving money. There are quite a few variables that should be considered to ensure proper burner operation. Some are simple, but others require more input. Here are some tips to help you do it correctly.

## CAPACITY

This is a critical consideration to ensure the burner has adequate capacity for your specific process. Too little capacity can lead to a smaller workload and prevent the combustion system from reaching the required temperatures. This can lead to down time in production, which directly impacts a company's financials. Too much capacity results in overkill for an application, meaning you are paying more for a burner and not using it to the capacity level it was designed for. Understanding the capacity requirements and ensuring the burner can meet them will help prevent issues with production.

## TURNDOWN

Like capacity, it is important to understand what turndown performance is needed. Turndown is the ratio of maximum capacity to the minimum capacity. For example, you have a burner with a maximum capacity of 5 million BTU/hr and a minimum capacity of 100,000 BTU/hr. This means that your turndown ratio is 50:1. Turndown is an indicator of flexibility of a burner to handle various load sizes. The turndown for a burner must be equal to or larger than the turndown that is required for a particular application. Although the turndown required for most applications is not large, it is still an important thing to factor in when selecting a burner.

## TEMPERATURE

It is important that the burner selected has the temperature performance to meet the needs of the application. Burners are divided into two categories, high temperature and low temperature. Low temperature burners operate primarily below 1,000°F (528°C).

## PROCESS DETAILS

Understanding the details of the process and meeting the specific requirements will ensure you choose the right burner. For instance, if the situation calls for indirect fire, one easy way to achieve this is to fire into a tube which isn't possible with every burner and would be a key consideration in burner selection.



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### FLAME GEOMETRY

Make sure it has the proper flame geometry to fit a specific chamber. For example, a flame that is too long can cause flame impingement. When firing into a chamber it is important to be aware of backpressure and cross velocities. Backpressures can impact overall burner operation. Too much backpressure can even stop gas or air flows to a burner. Cross velocity causes issues with lighting and flame stability, but can help be prevented by using a secondary sleeve.

### MOUNTING

One of the most obvious, but often overlooked areas of proper burner operation and maintenance is

mounting. Burners can be mounted via wall or in-duct. Wall mounted burners are easier to access allowing for easier maintenance, however wall mounted burners tend to be impacted by cross velocities. In-duct burners are enclosed in the duct, which means they are more difficult to access, however they are better suited to help prevent the cross velocity issues associated with wall mounted burners. The specific application will help drive the type of mounting required.

### IGNITION

Burners can be lit by either pilot or direct spark. Some burners allow for both methods, but like many other instances, the application itself will dictate which method is best.

Finally there are number of special considerations to keep in mind when selecting a burner. Codes, fuel type, emissions requirements, area rating (hazardous duty) are just a few of the things to keep in mind. Some considerations are clearly listed in the product instructions. Others might not be so obvious or are more in depth. Processes too can be very complex, particularly if a number of special conditions apply. It is always a good idea to consult a burner expert to ensure the right decision is made every time.

### For More Information

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