



All Exhaust Systems Are Not the Same

While there are lots of articles about selecting the right boiler, burner and controls, there are far fewer about boiler exhaust systems and stacks. But that doesn't mean that all exhaust systems and stacks are the same. Designing stacks to provide the right amount of natural draft involves a number of factors such as:

- Desired amount of excess combustion air needed to assure complete combustion.
- Temperature of the flue gases leaving the combustion zone.
- Composition of the combustion flue gas, which determines the flue gas density.
- Frictional resistance to the flow of the flue gases through stack, which will vary with the materials used to construct it.
- Heat loss from the flue gases as they flow through the stack.
- Local atmospheric pressure of the ambient air, which is determined by the local elevation above sea level.

Today, engineers rely on computer-aided systems to analyze and design a stack depending on the application. For freestanding stacks, engineers take into account the following criteria: composition of combustion products, thermal and chemical conditions, corrosion effects, structural analysis including wind load analysis, seismic calculations and vortex induced load analysis.

Several materials are used to construct freestanding stacks. The structural shell can be made of carbon steel, COR-TEN® steel or stainless steel, depending upon specifications or analysis results requirements. The insulation products commonly used are high-temperature mineral fiber, ceramic fiber, airspace and refractory. When applicable, metal jackets can be used to cover and protect the insulation. These are typically made of aluminum or stainless steel.

Incorporating an exhaust system engineered with the latest technology can enhance boiler efficiency, and now Cleaver-Brooks has the in-house engineering expertise to design any stack system, from a simple installation-ready system to the most complete freestanding stack. In March 2011, Cleaver-Brooks purchased Cheminée Lining, an exhaust solutions company recognized in the industry for its engineering expertise and quick delivery. Among its engineering developments is an exclusive male-to-female jointing system on installation-ready systems that eliminates the need for adapters and accelerates the installation process by up to 40 percent.

The products available in the installation-ready line fit Cleaver-Brooks full line of condensing boilers, package hot water and steam boilers and allow for complex arrangements of multiple boiler applications.

In addition, Cleaver-Brooks commitment to research and development means it employs the latest technology and techniques. As a result, quotes can be provided within days not weeks. Likewise, design and delivery is faster than ever.

For more information or to view Cleaver-Brooks broad range of exhaust solutions products, visit cleaverbrooks.com/exhaustsolutions.