Properly caring for a boiler pressure vessel and its associated refractories is important to ensure the longevity and reliability of the system. Understanding refractory and its recommended maintenance will help to mitigate extended boiler outages and costly repairs.

Boiler refractory generally can be divided into three main categories: burner throat/dry oven tile, furnace liner and access door insulation. These parts primarily protect the steel in the boiler from overheating; however, the throat/dry oven and liner tile also assist in the combustion process.

**Dryback vs. Wetback**

The access door differs in a dryback boiler versus a wetback boiler. The rear-access door in a dryback uses a high-temperature refractory in the lower half and has lower-temperature insulation on top. It may also include a directional baffle constructed of refractory (monolithic-style) or a high-temperature brick (tile) with bonding mortar. The purpose of the door is to access the entire rear tube sheet.

The wetback boiler has a small, high-temperature refractory-filled plug providing access to the turnaround chamber and second-pass rear tube sheet.

The access door in the front of both boiler types may feature lower-temperature refractory insulation or an insulating-fiber material.

Routine maintenance of the rear door should occur every six months using a diluted high-temperature bonding mortar that is lightly wash coated over the surfaces. Expansion cracks that are 1/8” in size or smaller are okay and will seal when the unit is fired again.

**Warning Signs**

Signs of access door failure will be a whitening (chalking) of the paint or flaking. An excessive rise in stack temperature may signal a front directional baffle failure enabling hot combustion gas to enter the stack after the second pass, or a rear-access door baffle failure allowing combustion gases to bypass the second and third passes.

Large rear door cracks or missing chunks need to be fixed immediately with a bonding mortar or an acceptable plastic-like material. In some cases, the entire door may need to be re-poured in the field per the manufacturer’s instructions. Once completed, a protective wash coat should be applied.

Properly resealing and closing the access doors is very important, including the use of acceptable gasket materials and following approved door-tightening procedures.

Look for furnace throat and liner problems via a visual inspection through the rear sight port into the furnace or when the boiler is open for inspection.

When the front of the boiler is open, exposing the burner housing, check the seal between the burner throat and steel housing. This should be intact. If it isn’t, replace the sealing material or possible combustion and/or steel housing problems will occur.

Evidence of burner throat/dry oven problems such as large cracks or missing chunks is most effectively addressed by replacing the respective tile and using a suitable bonding material to secure it.

In the case of the furnace liner, follow the same procedure as with the throat/dry oven, but make sure any old bonding material is removed before applying new material.

To learn more, contact your local Cleaver-Brooks representative at [http://findarep.cleaverbrooks.com](http://findarep.cleaverbrooks.com) or visit Cleaver-Brooks at [cleaverbrooks.com](http://cleaverbrooks.com).