



The BackYard Bubba revolutionary Heat Management System

A Pitmaster's dream: Total and precise control over intake, draft, and exhaust

Our patent-pending **TrueQ™ Heat Management System (HMS)** gives the Pitmaster total and precise control over three (3) very important aspects of heat management, specifically, intake, draft, and exhaust.

This is accomplished via our **Vari-Breeze™, Vari-draft™, and Vari-Stack™** HMS designs. It is truly revolutionary and gives the Pitmaster multiple ways to influence the flow of heat and in the entire smoker ... not just at intake or exhaust.

Fundamental to our HMS and our patent-pending designs is the inherent, favorable thermal mass provided by concrete block, also known as Concrete Masonry Units (CMUs). CMUs are exponentially more thermal efficient than cast iron/plate steel. There is a plethora of information available to support that statement.

CMUs are used to build our fireboxes, cook chambers and stacks. Approximately 13% of the surface area of a TrueQ™ smoker is constructed from 3/16" and 1/4" plate steel, with the remainder being CMU. Our drawer faces only are constructed of 10 gauge sheet plate and seldom exceed 120F so heat resistant gloves, though recommended, are not a requirement for opening the drawers.

And for those of you who question how we "seal" the seams between each CMU or where a drawer face meets the CMU, we don't need to for several reasons. First, if you have a square build the potential for leakage is minimized. Second, we move heat and smoke quickly and efficiently through the chambers. By mere design, and due to our TrueQ™ HMS, heat and smoke do not back up in the cook chamber and as a result don't seek an escape via CMU seams or drawer faces that don't fit flush.

We have even purposefully tested our builds where the unit is not level both end to end and side to side. It is actually sitting on a concave surface end to end and side to side. There is no heat or smoke loss because we move heat and smoke so effectively.

CMUs are exponentially more thermal efficient than cast iron/plate steel and retain and store huge amounts of heat both inside the firebox and inside the cooking chamber. To ensure that heat and smoke does build up in the firebox, we therefore need to, and do, move heat quickly and efficiently from the firebox through the cooking chamber which results in excellent end product because of clean smoke and balanced, convective heat.

Though not explicitly necessary, the natural thermal mass of our smokers can be enhanced by either filling the core of each CMU with sand.

We should note that our test kitchen is located an hour north of Houston, Texas in a generally mild but very humid climate. We have tested in sub-freezing temperatures but have noticed little difference in heat loss or fuel usage as the CMU retains an amazingly large amount of heat. North of the Mason-Dixon line, we recommend filling the core with sand (not rock or concrete).

To give you an example of the heat we retain, the exterior side walls of our fireboxes seldom exceed 150F and the chamber walls seldom exceed ambient air temperature. Drawer faces seldom exceed 120F. There is not a cast iron smoker on the market that can assert such efficient heat retention much less the resulting safety that results. Though we have not measured it, common sense says the heat loss via transfer through the plate steel is exponentially higher than CMU ... hence, more favorable thermal mass.

CMUs also literally “breathe” naturally which inherently promotes a convective heat environment. It is also an inherently moist heat environment because CMUs also retain moisture and as the CMS absorbs heat that moisture is released into the chamber air providing a positive contribution for the cooking session. We are also convinced that the absolutely beautiful smoke ring we obtain is due in large part to the moist, convective environment inside our chambers.

The Firebox and our Vari-Breeze™ intake design

There is one firebox size and design for all of our smokers. Yes, you heard us right. We won't waste your time here reiterating all the reasons why we decided on that strategy, but we will be happy to explain how a “one size fits all” firebox is absolutely the best decision we ever made.

For those interested, our standard firebox measures 23.4” x 23.4” x 22.9” for a total of 12,566 cubic inches.

As an example, we are currently running a 4,462 square inch smoker in our test kitchen using a firebox that measures approximately 38% of the recommendations in the Felton calculator. Fuel efficiency is very favorable \$.254 per yielded pound when loaded with 150 lbs. of proteins.

And for reference, even with that smaller firebox, that pit is probably the most efficient and well balanced pit in our test kitchen (we have three functioning TrueQ™ smokers in our kitchen built and fired up at any one given time).

In other words, we have come to the conclusion that firebox size in and of itself is a secondary consideration in the design of our pits. Moving the heat and smoke quickly and efficiently is tantamount to firebox size in our opinion.

We should also note that it is entirely possible to increase the size of the firebox at a very, very minimal cost. That is one of the features of our smokers ... the Pitmaster is in complete control. It is virtually impossible to alter the size of traditional cast iron/plate steel smoker (unless you are an experienced welder).

We utilize the core of the CMU as our intake portals. Those portals can be either “covered” through our proprietary steel plate core covers which cut off 98% of all air intake, or, the Pitmaster can simply adjust the air via a simple baffle of 4' x 4" x 2" CMU.

The Pitmaster can also build dual-fireboxes into any of our models which is a truly unique functionality as it allows for yet another means by which to balance out the heat in the cook chamber (especially useful when smoking whole hog) or when expanding the smoker for a large event or commercial application.

Because of our CMU construction, and how we move heat, to illustrate how effectively we move heat our fireboxes can literally be used as a seat despite internal temperatures well in excess of 750 degrees or more (depending on size of fire). The CMU simply does not get very hot. The walls of the firebox seldom exceed 175F. That is because the heat not being moved from the firebox into the cook chamber is being stored. The longer you cook, less fuel is needed because the firebox is retaining a lot of heat.

To manage excess heat in the firebox, Pitmasters are accustomed to adjusting the intake baffle, etc. Though that is entirely possible with a TrueQ™ smoker, our Vari-Breeze™ design also allows the Pitmaster to release heat via small vents, if you will, from the top of the firebox as needed, and once the chamber ambient temp has cooled close those vents. When closed, those vents are air tight and there is zero heat or smoke loss through the seal because we move the heat out of the firebox quickly and efficiently.

Further, the inherent design of CMUs allow the Pitmaster to take advantage of draft from any wind direction via the cores of the CMU around all sides of the firebox, thus negating the need to move the smoker to take advantage of seasonal winds. Also, when draft may be needed at a higher level in the firebox to move heat that may get trapped in the upper firebox due to too large of a fire, our Vari-Breeze™ design allows the Pitmaster to easily expand the intake at the top of the firebox by removing one or more core covers to take advantage of air coming from any direction into the firebox.

Finally, most Pitmasters are accustomed to losing significant heat when adding fuel. Not so with a TrueQ™ smoker. Our firebox door design allows to add fuel through an “easy in and easy out” door that is only 8" x 15", seals perfectly with no need for gaskets (add them if you like), and the door and our 14" x 14" x 14" charcoal basket design (included) allows for the use of 16" splits of hardwood.

Vari-draft™ heat plate – influence the direction of heat before it gets into the chamber

Heat plates have become a standard feature on most non-production smoker designs these days. Given the firebox and chamber design of TrueQ™ smokers minimize the distance between initial heat source and the far end of the smoker, the even without a heat plate option, our smokers are fairly well balanced (within 15 degrees, depending on grate tier level) even without the deployment of our HMS.

However, our research finds that virtually all of the heat plate designs on the market tend to be lacking in the following areas:

1. Accessibility
 - a. By default, they have to be located under the cooking grates, which means they are
 - b. generally inaccessible to adjust during a cook (unless you are OK with heat loss, cooling proteins, greasy mess, etc.).
 - c. They are therefore rendered essentially useless if there are heat balancing challenges in the middle of a cook.
2. The movement and transfer of heat throughout the cook chamber is
 - a. usually unable to be readily addressed (see 1(b) above)
 - b. The Pitmaster therefore has no control over the plates once the cook has started
 - c. must live with the size and location of the “holes” that the manufacturer believed was best
3. Hard to clean
 - a. see accessibility above
 - b. Screws and bolts, if used to attach the plate, tend to “lock up” with grease and corrosion, especially if not cleaned regularly.

To virtually eliminate the design deficiencies identified above, TrueQ™ introduces the following designs in our heat plate system which give the Pitmaster total and precise control over the heat distribution in the cook chamber:

1. Series of six (6) 8” x 20” 3/16” heat plates accessed via an easily accessible (during a cook) drawer.
2. Each plate lays on a tray in the drawer which keeps it in place – no need for screws, etc.
3. Each plate is fabricated with variable size “vents” ranging from ½” to 3” through which the Pitmaster can literally direct heat to or away from select areas of the chamber should the chamber become imbalanced.

To manage heat with precision, all that is needed is to pull out the drawer (light and easy to draw), adjust the vents as needed and/or the location of the plate(s) as needed, and close the drawer. Fast, efficient, and minimal heat loss because the cooking chamber drawer is never opened.

To clean the plates, each plate is easily removed, de-greased, cleaned and returned. Vents can be removed, cleaned with soap and water, and reinstalled in literally a few minutes.

And, our TrueQ™ Value Package provides the Pitmaster with three (3) Maverick thermometers, one of which we recommend dedicating to monitoring ambient temps at the heat plate level.

Vari-Stack™ HMS considerations.

Temperature variations in cooking chamber are inevitable and every Pitmaster is challenged to maintain temperature balance in their smoker to ensure even cooking, etc.

Once air and fire is managed in the firebox via Vari-Breeze™, and once heat is properly directed into the cooking chamber via the Vari-Draft™ heat plate system, our HMS also allows the Pitmaster to

manage and direct heat at the top of the cooking chamber via our Vari-Stack™ exhaust system design.

Vari-Stack is really very simple. Traditional cast iron/plate steel smokers overwhelmingly provide the Pitmaster only one stack to manage the exhaust and generally accepted practice is to not tinker with the stack baffle and try and control draft at the complete opposite end of the smoker (the firebox).

With the TrueQ™ HMS and our Vari-Stack™ system design, The Pitmaster has anywhere from 5 to 9 different “on demand stacks” to manage the exhaust via what are essentially air-tight vents in the top of the smoker. As temps inside the cook chamber are monitored at the top of the smoker, if an imbalance is identified the Pitmaster can open (or close) any one or more of the vents to help re-direct heat to the area of the chamber either lacking or in need.

Of further benefit is that the Vari-Stack system even allows the Pitmaster to control the heat after the heat has left the chamber via variable stack heights.

In summary, our patent-pending **TrueQ™ Heat Management System (HMS)** gives the Pitmaster total and precise control over three (3) very important aspects of heat management, specifically, intake, draft, and exhaust via our **Vari-Breeze™, Vari-draft™, and Vari-Stack™** HMS designs. It is truly.

Total and precision control of the smoker.

The Pitmaster's dream.

The Camelot of BBQ smoking.

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