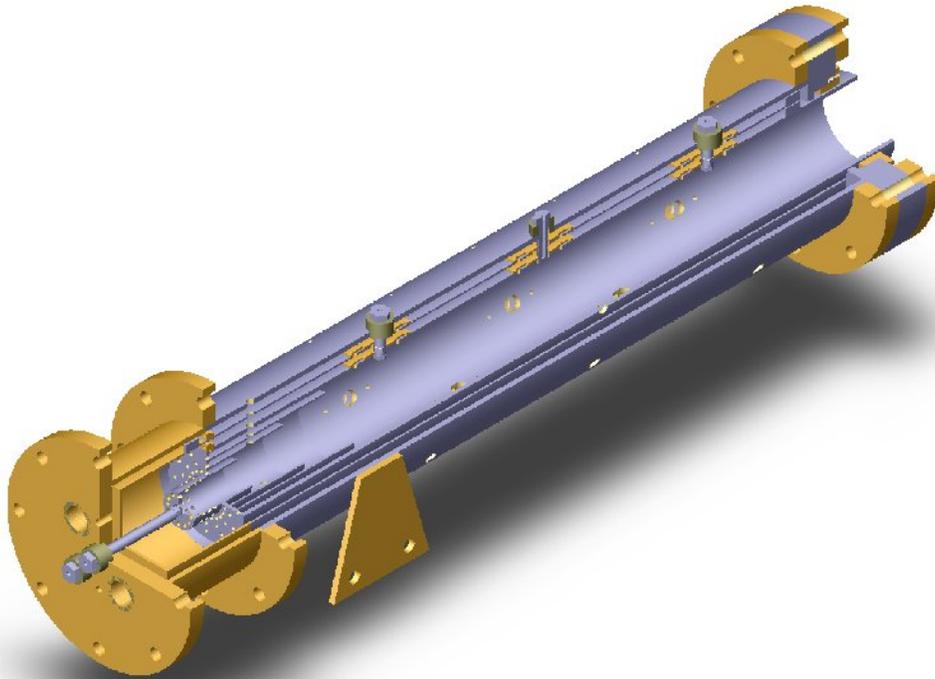


Laymen's Introduction to VASTechnology™

11 June 2010

VAST is an acronym that stands for Value Added Steam Technologies. The VASTeam researches, designs and develops new applications that use water or steam to cool combustion processes. We try to identify applications for VASTech that bring “added value” to the burning of fuels to create heat in industrial processes. Here is what our fundamental invention, the VASThermogenerator, looks like in a cut-away version of our current test unit.

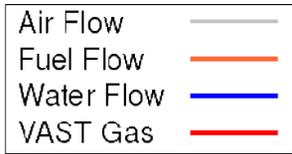


What does a VASThermogenerator do? It burns a wide variety of fuels and injects water or steam into the hot combustion zone where the fuel is burning in order to cool the unit and keep it from melting. The water flashes to steam which combines with the products of combustion to form what we call VASTgas™. This hot energetic working fluid can then be used to spin a turbine, drive a piston, heat other fluids or gases or as a steam source in certain applications. VASTgas is composed of the nitrogen out of the air, N₂ plus the CO₂ from clean burning of the fuel, plus a lot of steam. In some of our applications, there might be 6 times as much steam by mass as there was fuel burned! That's a lot of water and the VASThermogenerator needs to be used within the patented VAST Wet Combustion Cycle to recapture the latent heat of vaporization - the energy that is required to convert water at 212°F to steam at 212°F. When that energy is recovered by using our patented power cycle, a VASThermogenerator is actually a bit more efficient for many real world applications. In any case, it always does a great job of burning cleanly.

Why doesn't the VASThermogenerator create pollution like other combustors? Two reasons: water keeps the burning zone cool and the long combustion barrel provides sufficient combustion

VAST

residence time to achieve full oxidation of the carbon in the fuel, first to CO and then on to CO₂. By keeping the temperature of the burning zone below 2,300°F, the VASThermogenerator minimizes the formation of nitrogen oxides, specifically NO, NO₂ or NO₃ collectively represented by NO_x (“knocks”) which is a critical component of smog. Because fuel burns from 650°F to around 4,000°F, there is a very wide range of temperatures (650°F to about 2,300°F) at which a VASThermogenerator can completely burn a fuel without creating a lot of NO_x. The VASThermogenerator keeps its operating temperatures well within this low pollution range, thus never creating the pollutants that some post-combustion process like expensive catalytic converter add-ons would have to clean up.



Below is a flow diagram that shows how air, fuel and water or steam are injected into the VASThermogenerator and how they burn from left to right. The result? Exhaust so clean you can breathe it!

