



## CFD Modeling Capabilities

At **XRG Technologies**, we utilize cutting-edge CFD modeling capabilities in the up-front design phase of a project to avoid common issues that reduce fired heater safety, reliability, and environmental performance.

Too often, lack of knowledge of the firebox aerodynamics and combustion process lead to poorly designed heaters and end results that fall short of client expectations. Burner arrangement, firebox dimensions and shape all play a significant role in heater performance. Utilizing CFD too late in the project is costly and often limits substantial design changes.

**XRG Technologies** has the experience and skill set to approach heater design differently than any other company at present. We combine our expertise in combustion, heat transfer and CFD to determine the optimal burner layout and firebox shape for new fired heaters to ensure the following:

- Flame impingement on coils and flame clouds that result in safety and reliability risks are prevented
- Firebox thermal efficiency is guaranteed
- Firebox temperatures are calculated accurately, ensuring that emissions guarantees are met
- Firebox dimensions are minimized, saving on capital cost
- Burners produce flames with optimal shape
- Heat distribution is improved, resulting in lower fouling rates, longer coil life and improved thermal efficiency (lower fuel consumption equaling savings to owner)
- Technology such as selective non-catalytic NOx reduction can be accurately applied inside the firebox (a technique that requires precise knowledge of temperature field and residence times inside the firebox)

Every new equipment proposal includes a simplified CFD model of the radiant section at one steady state condition. The model will be complete at normal duty per the data sheets and will predict the performance, including flue gas flow patterns and approximate heat flux profiles. In the design phase, we will use a generic burner model with design fundamentals as required to meet the target emissions performance.

XRG Technologies is also adept in assisting with troubleshooting and problem solving. Breaking it down to basic engineering principles and truly understanding the fundamentals of heater design and performance, the XRG Team excels in providing enhanced solutions to solve the greatest industry challenges.

Contact us today!