

# Reinhold Environmental Ltd.



## 2010 NO<sub>x</sub>-Combustion Round Table & Expo Presentation

***February 8 & 9, 2010***

***Chattanooga, TN***

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# ***SNCR ADVANCEMENTS***

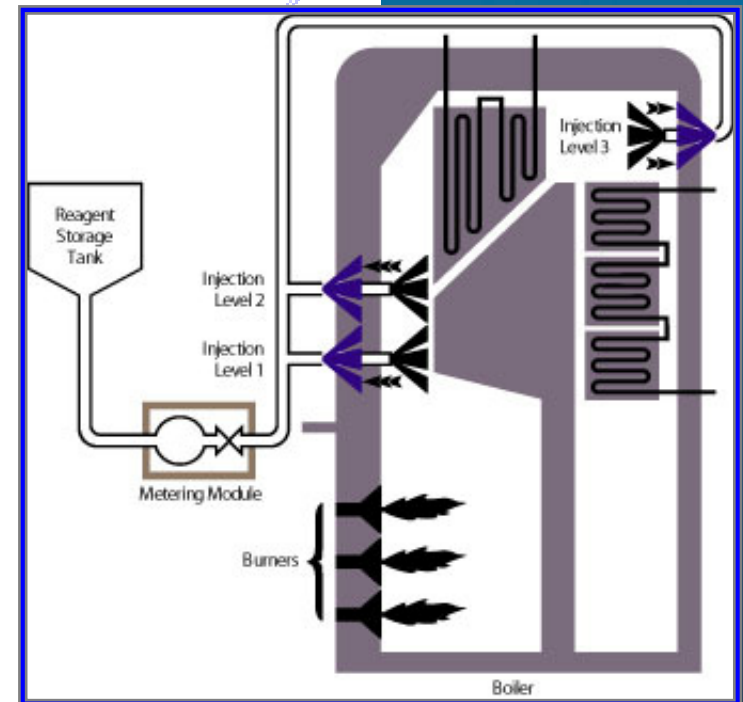
***NOx Round Table Conference  
February 9, 2010  
Chattanooga, TN***

***Kevin Dougherty – VP Marketing***



# SNCR Technology Options: NOxOUT<sup>®</sup> and HERT<sup>™</sup> Injection

- Over 500 Systems Installed Worldwide
- Injection of Urea Reagent in Upper Furnace
- ◆ NOxOUT<sup>®</sup> - Low Energy, High Momentum Droplets
- ◆ High Energy Reagent Technology<sup>™</sup> HERT<sup>™</sup> - High Energy, Low Momentum Droplets
- ◆ In-Furnace Gas Phase Reactions between NH<sub>3</sub> & NO<sub>x</sub>
- Process Reaction Temperature Range: 1600 °F to 2200 °F
- NO<sub>x</sub> Reduction: 30-70%



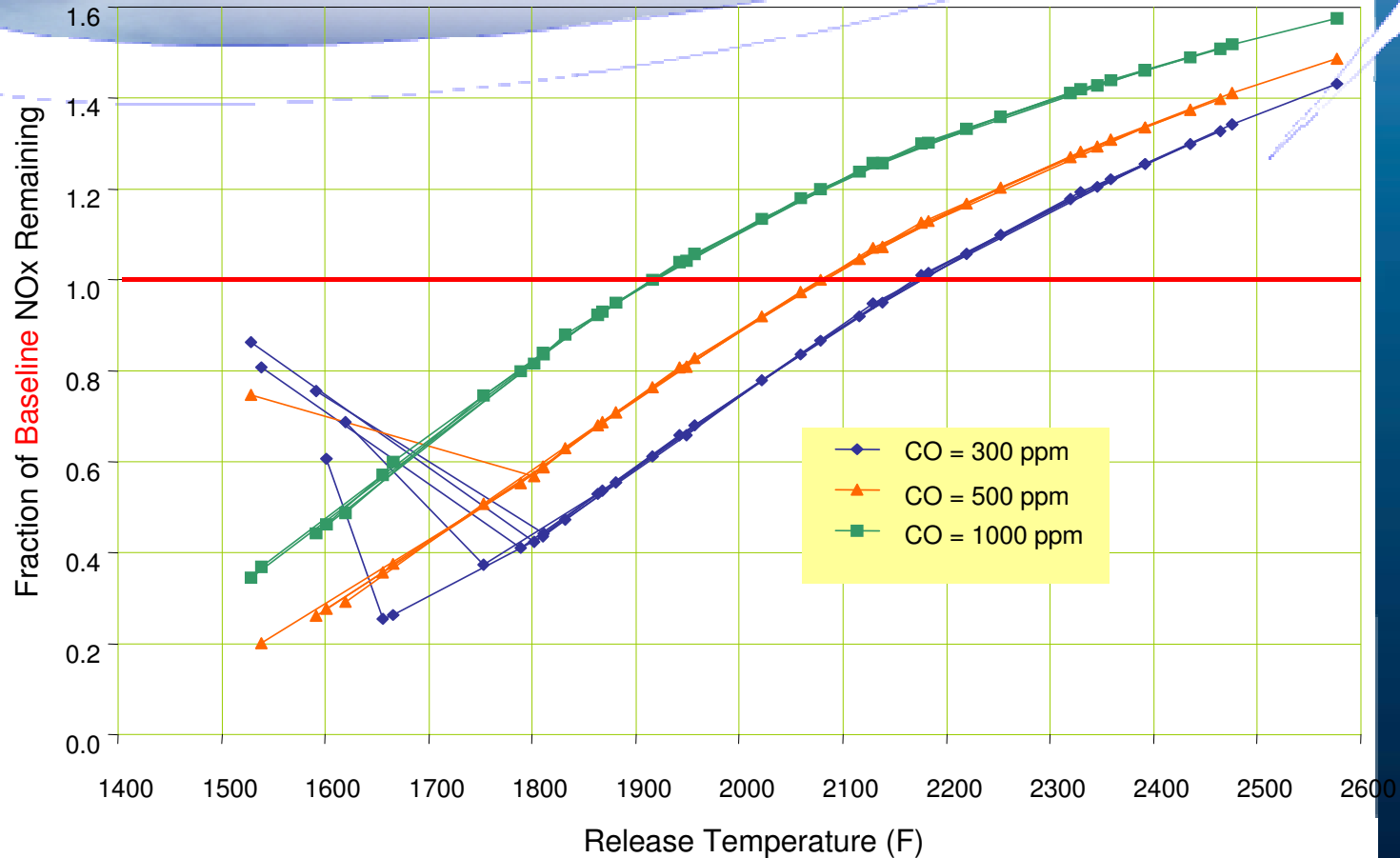
# Two Aqueous Urea Injection Techniques

- NOxOUT
  - Air atomized injector
  - High momentum droplets
- HERT
  - Mechanically atomized
  - High velocity carrier air
  - Smaller droplets than NOxOUT

# SNCR Performance

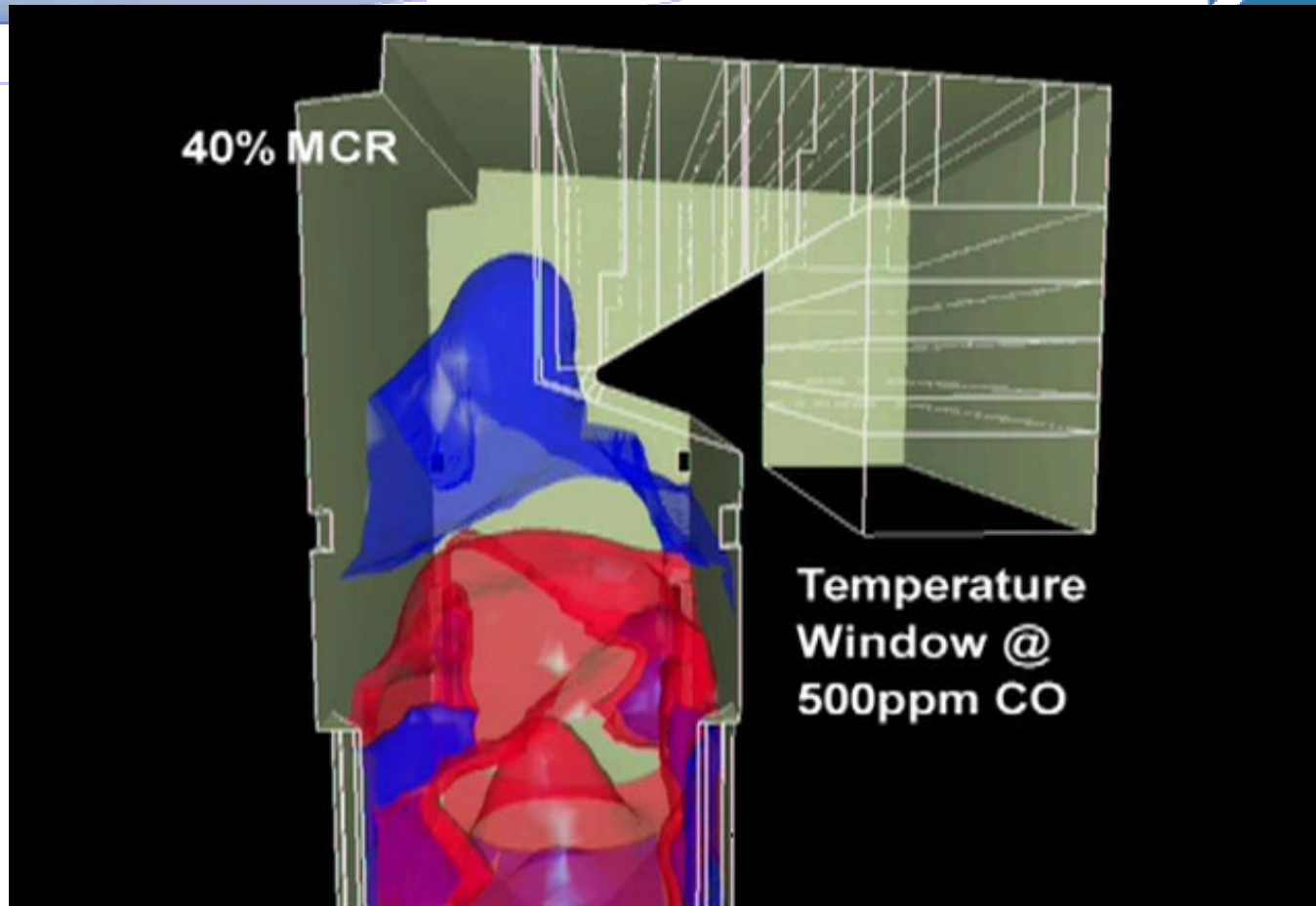
- Temperature Window for Optimal NO<sub>x</sub> Reduction
- Combustion Impact on SNCR Performance
  - Non-Optimized Combustion
    - Reduced SNCR Performance – Effect of CO
    - Combustion Re-Optimization
    - Variations in Combustion Process may require conservative SNCR approach to control ammonia slip
- Injection Technology and Design is Critical
  - Modeling and Experience are key to performance
  - Technology Options for Maximum Flexibility

# Effect of CO Concentration on SNCR Performance

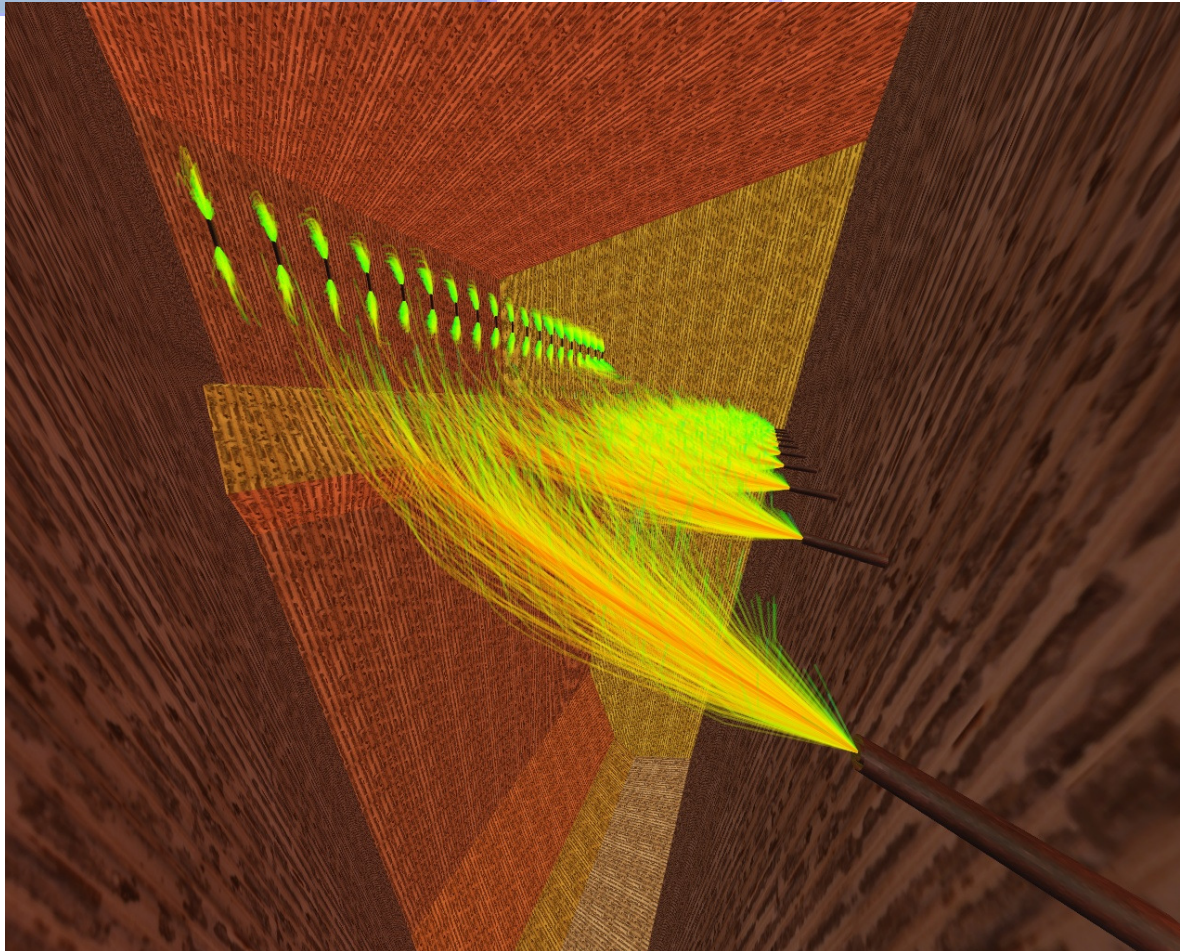


Note: Higher CO Levels Increase the Rates of NH<sub>2</sub> Formation and NH<sub>3</sub> Oxidation to NO; Effective NO<sub>x</sub> Reduction Window for Process is Shifted to a Lower Temperature

# Effect of CO Concentration



# NOxOUT Injection



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