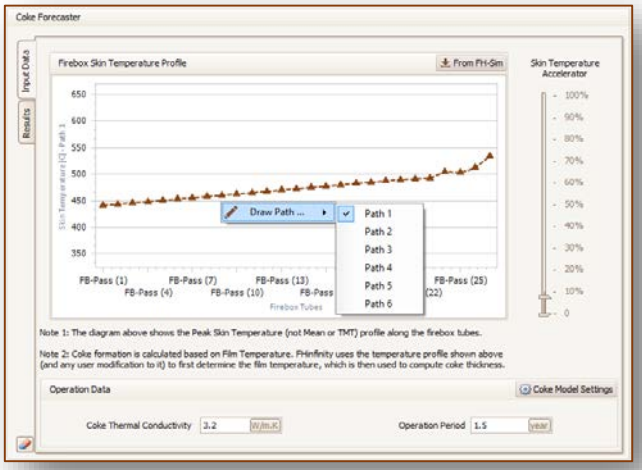
Coke Forecaster

Predictive Fouling Analysis for Firebox Tubes

FHinfinity Analyzers

Coke Forecaster© is a specialized post-simulation tool within FHinfinity© designed to predict the rate and distribution of coke deposition in firebox tubes over time. Unlike static fouling factors, this module dynamically models coke growth using an advanced correlation based on Threshold Fouling Conditions. It operates on the fundamental mechanism of Deposition minus Removal, calculating the net fouling rate by balancing chemical reaction kinetics (deposition in the thermal boundary layer) against fluid dynamic shear stress (removal by turbulent eddies).



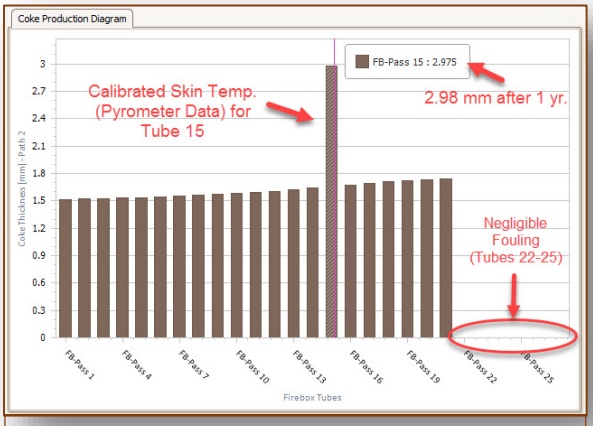
Key Technical Features

Physics-Based Mechanism: Utilizes a modified Arrhenius equation that accounts for both foulant formation and removal rates.

Field Data Calibration: Users can fine-tune model constants using laboratory data or field measurements to match specific crude oil characteristics.

Flexible Input & Override:

- Auto-Import: Seamlessly imports skin temperature profiles from the main simulation.
- Manual Correction: Allows engineers to adjust the temperature profile manually—either by shifting the entire curve or correcting specific tube temperatures.
- Smart Conversion: Edits are applied to Tube Skin Temperature (a measurable field parameter), while the engine automatically converts these to Film Temperature for precise kinetic calculations within the boundary layer.



Coke Forecaster Result

Operational Workflow

- Define Operation Period: Set the forecasting duration.
- Select Passes: Analyze individual passes or the entire coil independently.
- Run Prediction: The solver calculates coke thickness progression for each tube.
- Override to Simulation: Export predicted coke thicknesses to the Fouling Page via the *Override* feature to refine the simulation with actual fouling data.

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