

# Rapid Cementing Design Selection Using Case Comparison in CEMPRO

## Challenges

Efficiently compare multiple cementing scenarios, with individual simulation reviews hindering assessment of relative performance and selection of the optimal design.

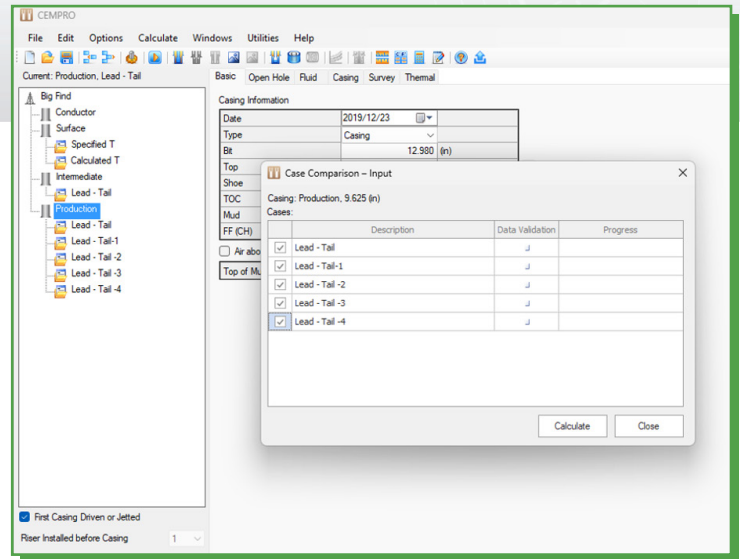
## Solution

CEMPRO's case comparison with multi-threaded execution enabled rapid evaluation and selection of the optimal cementing design.

## Results

Poor-performing designs were quickly identified and eliminated early in the process, allowing teams to focus on the most promising options. The optimal design was selected with clear visual justification, reducing total evaluation time by over 70% and enabling engineers to confidently explain and defend their decisions to operations teams.

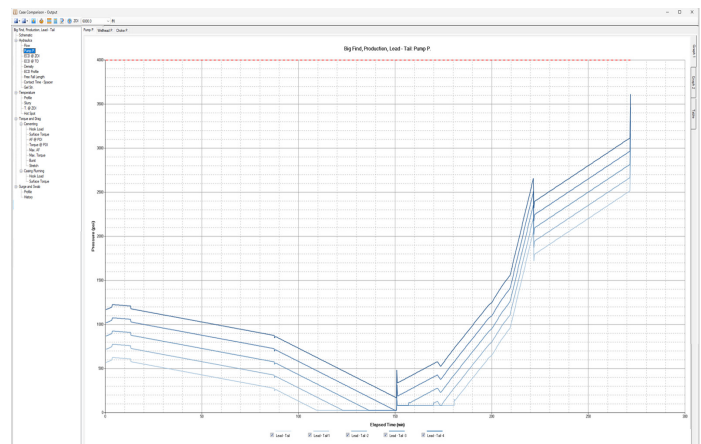
Cementing design often requires comparing multiple scenarios that differ in pump rate, slurry density, spacer volume, or displacement sequence. While all designs may appear acceptable individually, their relative performance is difficult to assess when simulations are reviewed one at a time. Traditional workflows require engineers to open, export, and manually compare results across multiple runs, slowing decision-making and increasing the risk of overlooking critical differences. In this case, multiple cementing scenarios were created using identical well geometry and boundary conditions, with controlled variations in key design parameters, and evaluated using multi-threaded execution to quickly select the best design with minimal iteration time.



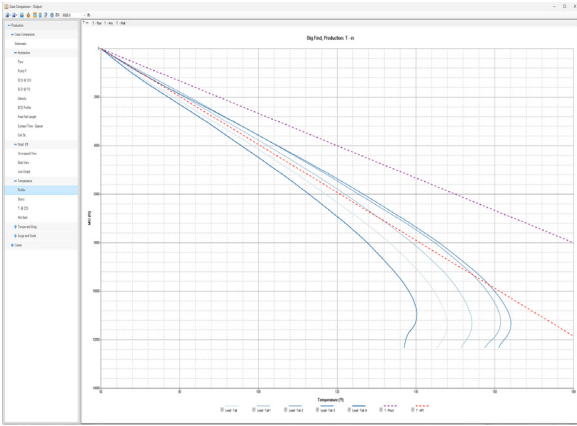
Case Comparison in CEMPRO

Using CEMPRO's Case Comparison feature, engineers reviewed all cases side-by-side, directly comparing:

## Pump Pressure



## Bottom Hole Circulation Temperature



## Displacement Efficiency



In the latest **CEMPRO** release, multi-threaded calculation allowed all cases to be executed in parallel, rather than sequentially. This significantly reduced total runtime when evaluating multiple designs.

## Performance Improvement

Number of Cases	Single-Thread Runtime	Multi-Thread Runtime*	Time Saved
3 cases	20 minutes	6 minutes	~69%
4 cases	24 minutes	7 minutes	~70%
5 cases	32 minutes	9 minutes	~72%

\*Actual performance depends on hardware configuration.

## Analysis Results

Multi-threaded execution reduced total evaluation time by 69–72%, enabling early identification and removal of poor-performing designs. Optimal designs were selected with clear, visual validation, providing engineers with robust, defensible results. By eliminating computational bottlenecks, CEMPRO allows rapid evaluation of multiple scenarios without delaying decision-making, supporting both engineering efficiency and operations confidence.



2050 W Sam Houston Parkway S, STE 1750, Houston, TX 77042, USA.

1-866-529-7479 [sales@linqx.io](mailto:sales@linqx.io) [www.linx.io](http://www.linx.io)

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