CEMENTICS is a comprehensive cementing design and evaluation software that delivers accurate simulations and successful cement jobs to achieve total zonal isolation. It is designed to handle complex well configurations and challenging environments, and provides a realistic approach to casing centralization and the calculation of forces. The software is able to simulate fluid property changes as pressure and temperature vary, and to model casing temperature evolution from deepwater wells to surface.

Realistic simulation, even in challenging environments

Using both established and newly developed models, CEMENTICS software enables accurate cementing design and simulation in challenging environments such as deepwater wells, highly deviated and horizontal wells, and complex cement plug placement operations. Based on a finite-element method solution, CEMENTICS software offers a realistic approach towards casing centralization and the calculation of forces. The software is able to simulate fluid property changes as pressure and temperature vary, and to model casing temperature evolution from deepwater wells to surface.

In addition to primary cementing simulation, CEMENTICS software designs optimal cement plug placement, minimizing contamination risk and increasing cement job success. CEMENTICS software also features a 3D-aperture mud displacement simulator that couples in-pipe mixing with annular displacement and accounts for casing rotation, reciprocation, and the azimuthal gradient effect, which is critical in deviated and horizontal wells. The 3D-aperture module incorporates a stiff-string centralization model that simulates angle orientation in the wellbore.

Complete cementing simulation package

By integrating a complete suite of cementing simulation capabilities, CEMENTICS software provides a comprehensive cementing simulation solution in a single user-friendly interface.
CEMENTICS software features a variety of modules, and these integrated features help Schlumberger engineers and customers review and create optimized cementing designs tailored to their unique conditions.

Job evaluation
- Import and play back a previously executed job
- Evaluate job execution and improve future cement placement

Cement plug placement
- Predict and minimize fluid interface movement
- Reduce slurry contamination
- Optimize and sensitize under-displacement volume
- Analyze risk, optimize design, and improve placement success

Mud removal simulation
- Model cement placement in the annulus with maximum accuracy using the 3D-aperture mud displacement simulator, accounting for casing rotation, reciprocation, azimuthal gradient effects, and fluid mixing in the annulus
- Present results in 3D, showing string position in the wellbore and fluid concentration maps

Cement fluid design
- Optimize slurry design based on type, density, pressure, and temperature
- Calculate material operational requirements
- Calculate laboratory test requirements
- Import fluids from local or worldwide fluid databases

Well planner
- Define complex well geometry
- Import directional plan, formation properties, and caliper data
- Define casing collars and various downhole restrictions

Laboratory automation
- Seamlessly integrate with cementing laboratory test management platform
- Use results of hydraulics and temperature simulator to automatically generate pressure and temperature ramps for testing.

Foam design
- Update foam quality continuously as a function of dynamic pressure and temperature
- Accurately predict downhole foam volume and position

Centralization
- Choose between classic casing string model and advanced new model based on the finite-element method
- Calculate casing standoff at different fluid positions
- Simulate centralization in washed-out sections or tortuous wellbores

Hydraulic and temperature simulation
- Handle compressible simulation as pressure and temperature vary
- Estimate better displacement volume

Gas migration analysis
- Analyze and minimize gas migration risk for each potential flow zone

† Available to customers in externally licensed CEMENTICS software.