Cementing Systems

Meeting the historic zonal isolation challenges plus gas migration, horizontal wellbores, and HPHT

Superior Materials

Superior Well Services, Inc. (SWSI) is well equipped, well supplied, and well experienced to provide a full range of oil- and gas-well cement jobs. Our retarders and accelerators enable control of cement-setting times, and our fluid-loss additives (FLA) help control leakoff of vital fluid into the cemented formation. If fluid leaches out of the cement slurry into the formation, the slurry will not fully hydrate, therefore it will not form a proper bond between casing and formation.

Our retarders are calcium- or sodium-based lignosulfate, and our FLA are hydroxyethyl cellulose (HEC)-based. These products have been used and well proven in well cementing for many decades. SWSI stocks all API cement classes used in petroleum-well cementing.

Our product line of casing-cementing hardware includes the following and many other items:

- Floating and guiding equipment
- Centralizers
- Cement baskets
- Cement scratchers
- Baffle and ball sets
- Cementer tools
- Cementing plugs
- Cementing heads/plug containers

Shown above is a cementing trailer, one of 314 Superior cementing units located in major basins throughout the U.S.A. Below is one of Superior's 21 bulk plants serving those operational areas.

A Superior cement bulk plant.

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WELL SERVICES

724-465-8904
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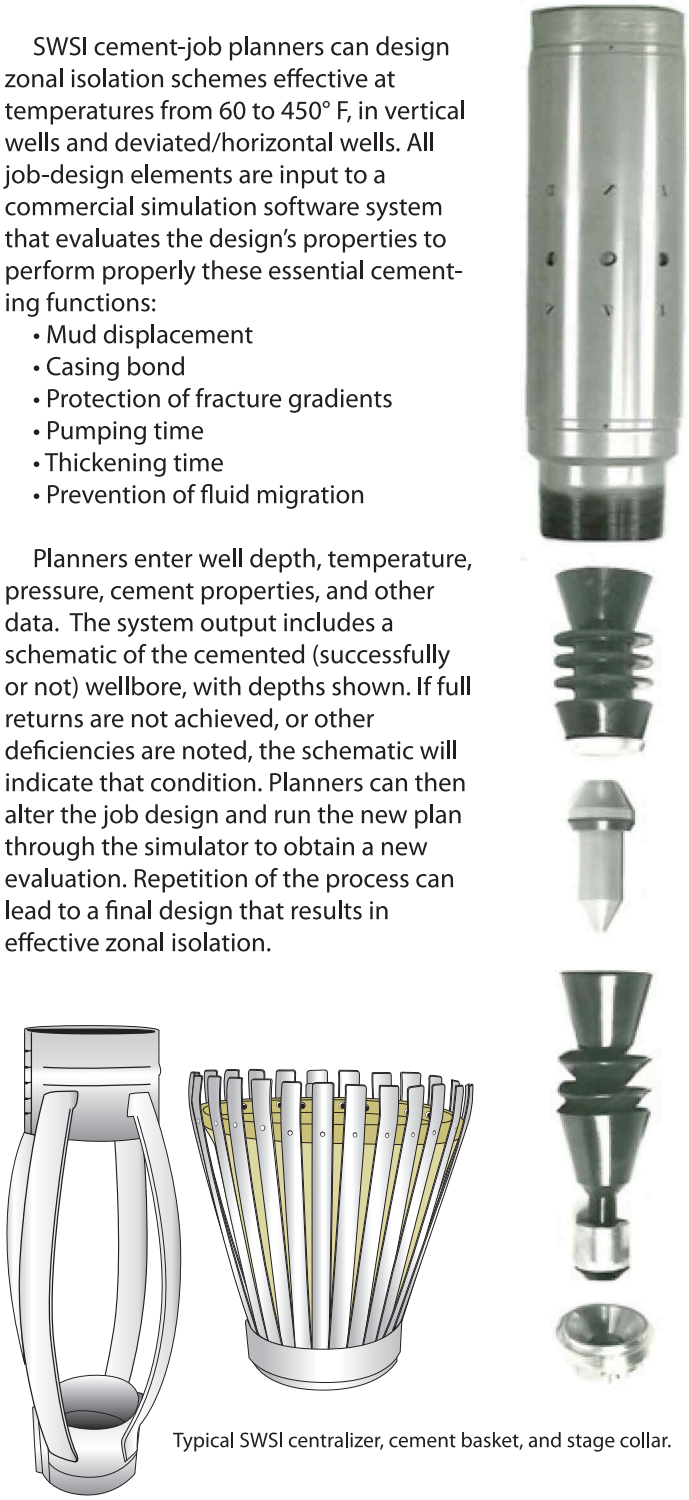
Job design

SWSI cement-job planners can design zonal isolation schemes effective at temperatures from 60 to 450° F, in vertical wells and deviated/horizontal wells. All job-design elements are input to a commercial simulation software system that evaluates the design's properties to perform properly these essential cementing functions:

- Mud displacement
- Casing bond
- Protection of fracture gradients
- Pumping time
- Thickening time
- Prevention of fluid migration

Planners enter well depth, temperature, pressure, cement properties, and other data. The system output includes a schematic of the cemented (successfully or not) wellbore, with depths shown. If full returns are not achieved, or other deficiencies are noted, the schematic will indicate that condition. Planners can then alter the job design and run the new plan through the simulator to obtain a new evaluation. Repetition of the process can lead to a final design that results in effective zonal isolation.



Typical SWSI centralizer, cement basket, and stage collar.

Gas migration after cementing

Increased emphasis on control of gas leakage from surface casing/wellbore annuli has raised the criticality of the need for measures taken during cementation, including from shallow casings. Regulatory agencies nationwide have intensified monitoring of sustained casing pressure resulting from gas migration and subsequent leakage.

Superior designs and pumps cement slurries that control gas migration immediately after cementation, and for the life of the well. Our Gas-X Fluid Migration Control System is a polymer-based treatment that extends prevention of gas (or fluid) migration to endure for the life of the well. Before they are implemented, all of our gas-migration designs are examined and evaluated by a third-party laboratory, Cementing Solutions, Inc., of Houston, Texas.

Generally, the presence of gas-bearing zones is known before cementing and gas migration is controlled by hydrostatic pressure furnished by drilling fluid in the wellbore. However, during the next few hours (or months) after cementing, gas may overcome the controlling pressure and migrate through the annulus, due to one or more of the following influences:

1. Gel-strength development within the cement slurry. For a period just after the cement slurry is pumped, the hydrostatic pressure of the wet cement column is adequate to overcome the pore pressure of the gas-bearing formation. As the cement column develops gel strength and begins to support itself by bonding to the casing and wellbore wall, its hydrostatic pressure diminishes and it loses the capacity to suppress gas migration. This critical time period is generally referred to as the "transition time."
2. Fluid loss from the cement to adjacent formations.
3. Cement volume loss during hydration reactions.

For more information on what SWSI can do to meet your zonal-isolation needs, visit our website.

www.swsi.com

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