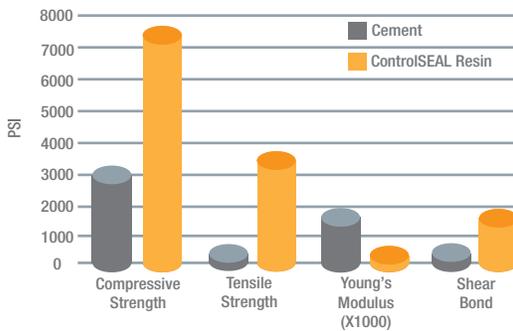




ControlSEAL™ Resin Sealant



ControlSEAL Resin Sealant Outperforms Cement



Applications

- Casing installation
- P&A operations
- Leaking production packers
- Control lines, gas leaks, valves and wellheads
- Remedial squeeze jobs
- Water flows and gravel packs
- Weak, permeable formations
- Isolation of adjacent wells

Long-term zonal isolation issues with oilfield cement annuli are common during the lifetime of a well. Wellbore stresses affect the long-term durability of the cement seal and often lead to well control issues. Remediation of zonal isolation failures can be costly and challenging to execute. ControlSEAL resin sealant offers an effective long-lasting barrier alternative to conventional cement, leaving you to assume control of your well.

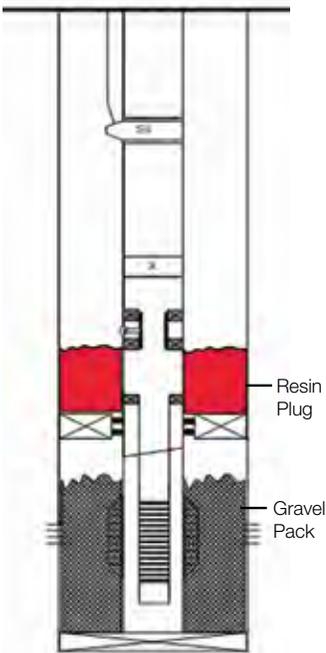
Features and Benefits

- Outperforms conventional cement for compressive strength, tensile strength and shear bonding
- Maintains long term durability using nonshrinking, noncorrosive and impermeable design
- Infiltrates microannuli and formation with solids-free design to create effective barriers
- Mixes and pumps easily on site: no special additives or water required with conventional oilfield equipment
- Remains stable even in hostile downhole conditions
- Stays intact while dropping through water, seawater and brines, reforming at the target zone
- Penetrable during perforation while maintaining form and integrity
- Tolerates temperature ranges of 40 to 275°F and densities ranging from 7 to 19 ppg
- Suited for offshore and onshore environments



CSI Technology wins OTC Outstanding Innovation of the Year Award (2007)

Simplified Schematic Showing Resin



ControlSEAL Resin Sealant case history #1

A client with a well located in the Gulf of Mexico was having problems with a leaking production packer. They were experiencing communication between the tubing/casing annulus and had made several unsuccessful attempts to resolve this issue. The leaking packer was preventing the well from being put on production. CSI Technologies was called out to pump ControlSEAL into the annulus to the top of the production packer, essentially locking the tubing in place and sealing the annulus so gas lift production could resume. After 24 hours, a successful positive pressure test was performed, indicating that ControlSEAL had successfully set against the top of the packer and sealed the annulus.

ControlSEAL Resin Sealant case history #2

During P&A operations on an offshore well, an operator had made repeated attempts to seal the 97/8-in. casing, however gas continued to leak to the mud line between the 97/8-in. x 13-1/3-in. annulus. After multiple attempts, the operator selected remediation by ControlSEAL. A window was milled through the 97/8-in. casing in the area of the leak, and 13 bbls of 16.5 ppg resin was pumped. The set time was 4 hours and the bottom hole temperature was 85°F. After the resin was placed, the well was shut in for 24 hours with pressure. After 24 hours, no bubbling was observed in the annulus, indicating a successful job.

Published articles

Sabins, Fred and Larry Watters. (2007). "Cement alternative has unique properties" E&P Magazine. http://www.epmag.com/EP-Magazine/archive/Cement-alternative-unique-properties_428

ControlSEAL Resin Sealant operating conditions and performance parameters

CONDITION / PARAMETER	CURRENT RANGE
Temperature	40°F – 275°F
Viscosity unweighted	100 cP - 425 cP
Surface Handling Time	Varies
Downhole Fluid Times	Varies
Initial Set Time	Varies
Hard Set Time	Varies
Unweighted Density	9.0 ppg – 9.2 ppg
Lightened or Weighted Density	7 ppg – 19 ppg
Shrinkage	None/Minimal
Shear Bond	1600 psi
Compressive Strength	>8000 psi