

TBC-BRINADD

A DIVISION OF TEXAS UNITED CHEMICAL COMPANY, LLC

Bridgesal-Ultra™ System

DESCRIPTION

The **Bridgesal-Ultra** System is composed of two basic products, **Bridgesal-Ultra** and **Bridgesal-Ultra SF**. These new products are improvements of the popular **Bridgesal-Plus** completion and workover fluids. Incorporating an increased concentration of bridging particles below 10 microns in combination with broad particle distributions of 120 and 325 mesh, the **Bridgesal-Ultra** products are able to provide improved filtrate control with a significant reduction in polymer levels.

Recognized throughout the world as the premier fluid loss control system, the new **Bridgesal-Ultra** and **Bridgesal-Ultra SF** can be used for:

- Lost circulation pills
- Perforating fluid loss pills
- Pre/post gravel pack fluid loss pills
- Sealing annular leaks in casing

Normally, the **Bridgesal-Ultra** products are mixed in saturated sodium chloride brine, but they can also be used with potassium chloride, calcium chloride, and sodium bromide as long as the base brine is saturated with respect to sodium chloride. **Bridgesal-Ultra** and **Bridgesal-Ultra SF** fluid densities range from 10.5 lb/gal to 13.5 lb/gal depending on the base brine and concentration of bridging solids utilized. **Bridgesal-Ultra** products are packaged in 50 lb or 25 kg sacks.

FEATURES

- Blended salt products contained in the **Bridgesal-Ultra SF** and **Bridgesal-Ultra** products provide optimized broad particle distributions for reduction in polymer concentrations, and improved sealing characteristics over a wide range of reservoir permeabilities
- **Bridgesal-Ultra** products when combined with **Plug-Sal®**, **Plug-Sal X** and **Plug-Sal XC**, generate a series of overlapping particle distributions which provide formulating flexibility to meet formation requirements in lost circulation applications
- **Bridgesal-Ultra SF** particle sizing allows not only the sealing of a permeable formation, but also permits removal through a 6 or higher gauge production or tell-tale screen
- Incorporates a patented derivatized starch/biopolymer combination for outstanding rheological and suspension properties to prevent settling at bottom hole temperatures up to 275°F with the addition of **pH Buffer**
- This polymer combination creates a unique synergistic effect creating an optimum viscosity profile giving **Bridgesal-Ultra** long-term suspension stability
- Upper temperature limit is extended to 325°F by including **Thermasal™-A** and **Thermasal-B** with **Polytex AHT** in system compositions
- Improved bridging/filtration control results in thin, ultra-low permeability filter cakes
- Compatible with **Ultra Breake M™**, the patented internal breaker system for filter cake removal

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Bridgesal-Ultra™ System Products

PRODUCT	COMPONENTS	FUNCTIONS
Bridgesal-Ultra SF	Xanthan gum biopolymer, derivatized starch, sized NaCl blend (44 microns)	One-sack lost circulation treatment
Bridgesal-Ultra	Xanthan gum biopolymer, derivatized starch, sized NaCl blend (120 microns)	One-sack lost circulation treatment
FL-7 Plus™	Derivatized starch	Fluid loss control additive
Plug-Sal® Plug-Sal X Plug-Sal XC	Medium to coarse NaCl	Bridging/lost circulation additives
pH Buffer	Magnesia compound	Buffer to maintain alkaline pH
Thermasal™-A Thermasal-B	Anhydrous salt and magnesia compound	Two component thermal stabilizing system
Polytex AHT	Polymer blend	High temperature fluid loss control additive

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Bridgesal-Ultra™ SF COMPOSITIONS MIXED IN SATURATED SODIUM CHLORIDE BRINE

Formation Permeabilities up to 2000 mD

COMPOSITION	TEMPERATURE, °F		
	150	200	250
Saturated NaCl Brine, bbl	0.90	0.88	0.87
Bridgesal-Ultra SF , lb/bbl	50.0	50.0	60.0
FL-7 Plus™ , lb/bbl	-	3.0	3.0
pH Buffer , lb/bbl	3.0	5.0	5.0
Ultrasal™ 10E , lb/bbl	30.0	40.0	30.0
Final Density, lb/gal	10.8	10.8	11.0

In-Screen Pill up to 250°F (6 or 8 Gauge)

Saturated NaCl Brine, bbl	0.83
Bridgesal-Ultra SF , lb/bbl	60.0
pH Buffer , lb/bbl	2.0
Ultrasal 10E , lb/bbl	20.0
Plug-Sal® , lb/bbl	50.0
Final Density, lb/gal	11.4

- If the bottom hole temperature is above 250°F, contact a TBC-Brinadd representative for the appropriate recommendation.

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Bridgesal-Ultra™ SF COMPOSITIONS MIXED IN CALCIUM CHLORIDE BRINE

Formation Permeabilities up to 2000 mD and 250°F

CaCl ₂ Brine Density, lb/gal	9.0	10.0	10.7
CaCl ₂ Brine, bbl	0.85	0.90	0.95
Evaporated NaCl, lb/bbl	100.0	40.0	20.0
Bridgesal-Ultra SF , lb/bbl	50.0	50.0	50.0
pH Buffer , lb/bbl	5.0	5.0	5.0
Final Density, lb/gal	10.75	10.9	11.4

In-Screen Pill up to 250°F (6 or 8 Gauge)

CaCl ₂ Brine Density, lb/gal	9.0	10.0	10.7
CaCl ₂ Brine, bbl	0.72	0.78	0.80
Evaporated NaCl, lb/bbl	100.0	40.0	40.0
Bridgesal-Ultra SF , lb/bbl	60.0	60.0	60.0
pH Buffer , lb/bbl	5.0	5.0	5.0
Plug-Sal® , lb/bbl	60.0	60.0	60.0
Final Density, lb/gal	11.4	11.6	12.2

- If the bottom hole temperature is above 250°F, contact a TBC-Brinadd representative for the appropriate recommendation.

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Bridgesal-Ultra™ COMPOSITIONS FOR BRIDGING COARSE SAND OR GRAVEL

Media	Formulation
40/60 Sand	50-60 lb/bbl Bridgesal-Ultra 40-50 lb/bbl Plug-Sal®
20/40 Sand	50-65 lb/bbl Bridgesal-Ultra 50-75 lb/bbl Plug-Sal
16/30 Gravel	50-65 lb/bbl Bridgesal-Ultra 45-50 lb/bbl Plug-Sal 40-55 lb/bbl Plug-Sal X
12/20 Gravel	50-60 lb/bbl Bridgesal-Ultra 40-50 lb/bbl Plug-Sal 50-60 lb/bbl Plug-Sal X
8/20 Gravel	50-65 lb/bbl Bridgesal-Ultra 50-60 lb/bbl Plug-Sal 40-70 lb/bbl Plug-Sal X

Note: Formulations contain the bridging solids concentrations necessary to seal the designated media up to 150°F. Contact a TBC-Brinadd representative for the proper recommendation above this temperature.

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Bridgesal-Ultra™ System

MIXING PROCEDURE:

Before adding **Bridgesal-Ultra** or **Bridgesal-Ultra SF**, the base brine must be saturated with respect to sodium chloride to prevent the bridging salt from being dissolved. Refer to the sodium chloride saturation tables referenced below.

SODIUM CHLORIDE BASE BRINE	TABLE B: NaCl and fresh water
POTASSIUM CHLORIDE BASE BRINE	TABLE F and G: NaCl and KCl brine
CALCIUM CHLORIDE BASE BRINE	TABLE I and J: NaCl and CaCl ₂ brine
SODIUM BROMIDE BASE BRINE	TABLE M: NaBr and NaCl brine

THE FOLLOWING INSTRUCTIONS ARE FOR MIXING ONLY; PLEASE CONTACT A TBC-BRINADD REPRESENTATIVE FOR THE PROPER RECOMMENDATION.

1. Start with the desired amount of base brine in the slugging pit or mixing tank.
2. Add the prescribed amount of evaporated sodium chloride (for saturation) through a hopper at 1-2 minutes per sack; agitate until the desired density is reached.
3. Add recommended defoaming agent as needed. Normally 1/2 can (2.5 gal) of **Defoam 2** for every 20 bbl of pill is sufficient.
4. Add prescribed amount of **Bridgesal-Ultra** or **Bridgesal-Ultra SF** through a hopper at 3-4 minutes per sack.
5. If necessary, add recommended concentration of **FL-7 Plus™** through a hopper at 8-10 minutes per sack.
6. Add 2-5 lb/bbl of **pH Buffer** through a hopper at 3-4 minutes per sack.
7. Allow the pill to agitate for 30-45 minutes prior to pumping downhole.
8. For moderate lost circulation or post gravel pack in-screen pills, add the prescribed amount of **Plug-Sal®** through a hopper at 1-2 minutes per sack.
9. For severe lost circulation, add the prescribed amount of **Plug-Sal** and **Plug-Sal X** through a hopper at 1-2 minutes per sack.

10. Allow the pill to agitate for 10 -15 minutes prior to pumping downhole.

- **If a hopper is not available, add all products at maximum agitation while circulating through a pump.**