

TBC-BRINADD

A DIVISION OF TEXAS UNITED CHEMICAL COMPANY, LLC

Hysal™ System

DESCRIPTION

The **Hysal** System utilizes either sized sodium chloride or calcium carbonate bridging particles for lost circulation pill applications requiring fluid densities above 12.5 lb/gal. The **Hysal** System is composed of four basic products, **Hysal SF**, **Hysal HD** and **Hysal HT** with sodium chloride bridging solids, and **Hysal C** with calcium carbonate.

The **Hysal** System can be used for:

- Lost circulation pills
- Perforating fluid loss pills
- Pre/post gravel pack fluid loss pills

Hysal products may be formulated in calcium chloride, calcium bromide and/or zinc bromide mixtures. **Hysal** is packaged in 50 lb or 25 kg sacks.

FEATURES

- Applicable across a broad range of fluid densities
- Provides effective bridging and temporary plugging of productive formations and flows easily through wire-wrapped production or tell-tale screens during displacement
- Can be used to seal inside a completion screen to prevent losses with the addition of larger bridging particles
- Incorporates a unique combination of derivatized starch, buffer, and bridging solids which provides excellent filtration control up to 250°F

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Hysal™ System Products

PRODUCT	COMPONENTS	FUNCTIONS
Hysal SF	Derivatized starch, low reactivity alkaline buffer, sized NaCl (44 microns)	One-sack lost circulation treatment
Hysal HD	Derivatized starch, high reactivity alkaline buffer, sized NaCl (44 microns)	One-sack lost circulation treatment
Hysal HT	Derivatized starch, sized NaCl (44 microns)	Lost circulation treatment for higher temperatures
Hysal C	Derivatized starch, low reactivity alkaline buffer, sized CaCO ₃ (65 microns)	One-sack lost circulation treatment
Hysal Activator	Glycol mixture	Polar additive
Alka Buff™-Hi	High reactivity alkaline buffer	Stabilizer for zinc bromide brines
pH Buffer	Low reactivity alkaline buffer	Stabilizer for calcium bromide brines
Thermasal™-B	High reactivity alkaline buffer	Stabilizer for higher temperatures
Plug-Sal® Plug-Sal X Plug-Sal XC	Medium to coarse NaCl	Bridging/lost circulation additives
Sluggit® Sluggit CM Sluggit Plus	Medium to coarse CaCO ₃	Bridging/lost circulation additives

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Hysal™ System

MIXING PROCEDURE:

Hysal C, Hysal HD, Hysal HT and **Hysal SF** are fluid loss control additives that are designed for use in high-density brines (12.5 - 18.5 lb/gal).

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

12.5-16.0 lb/gal

1. Add 0.5 gal/bbl of **Hysal Activator** to the prescribed amount of base brine.
2. Add 100 lb/bbl of **Hysal C, Hysal SF** or **Hysal HT** at 3-5 minutes per sack through a hopper.
3. Add recommended concentration of **Thermasal™-B** at 5 minutes per sack through a hopper.
4. Allow the slurry to mix, circulating through a choke to generate temperature, for approximately four hours.
5. Add recommended concentration of **Ultrasal™** products for base brine and bottom hole temperature solubility at 5 minutes per sack through a hopper.
6. 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.
7. For severe lost circulation, add the prescribed amount of **Plug-Sal** and **Plug-Sal X** through a hopper at 1-2 minutes per sack.

16.0-17.5 lb/gal

1. Add 0.5 gal/bbl of **Hysal Activator** to the prescribed amount of base brine.
2. Add 100 lb/bbl of **Hysal HD** or **Hysal HT** at 3-5 minutes per sack through a hopper.
3. Add recommended concentration of **Thermasal-B**, or **Alka Buff™ Hi** at 5 minutes per sack through a hopper.

4. Allow the slurry to mix, circulating through a choke to generate temperature, for approximately four hours.
5. Add recommended concentration of **Ultrasal™** products for base brine and bottom hole temperature solubility at 5 minutes per sack through a hopper.
6. 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.
7. For severe lost circulation, add the prescribed amount of **Plug-Sal** and **Plug-Sal X** through a hopper at 1-2 minutes per sack.

17.5-18.5 lb/gal

***NOTE:** Formulations from 17.5 lb/gal to 18.5 lb/gal should be verified by laboratory testing.*

- **If a hopper is not available, add all products at maximum agitation while circulating through a pump.**
- **If the BHT is above 200°F or 14.5 lb/gal, a TBC-BRINADD representative should be contacted for an appropriate recommendation.**