



# Technical Data Sheet

## VDF SQUEEZE

### *Product Description*

The **VDF SQUEEZE** unique chemistry will produce a hardenable slurry designed to be squeezed into down-hole loss zones. The high fluid loss and high solids content properties of the slurry combined with the large particle size distribution of the bridging and sealing materials in **VDF SQUEEZE** quickly form a solid plug allowing well-bore returns to be established and to remain throughout extended drilling operations. **VDF SQUEEZE** may be utilized in Water-based, Oil-based and Synthetic-based fluid systems, pilot testing is recommended to ensure compatibility.

**Recommendations:** A 100 bbl slurry should be pumped at the thief zone. Fill the backside with water. Close the BOP's and begin applying soft squeeze at 50 psi up to 250 psi and hold for 4-6 hours.

\*High viscosity treatments may be necessary to treat the most severe lost circulation events

\*\*Due to variations in base oils and synthetic base oils and the effects on barite, pilot testing is highly recommended to determine precise formulations. Slurries that become too thick should have up to 1.0 bbl of wetting agent added to aid in thinning the slurry.

### KEY BENEFITS

- seals are capable of withstanding swab and surge pressures incurred during normal drilling and pipe tripping operations
- No additional products are required
- No special mixing equipment is required
- Quick, effective, and economical response to severe lost circulation events.
- Can be used in Water base, oil based, and synthetic based fluid applications.

#### Key Properties

|                     |                   |
|---------------------|-------------------|
| Form                | Fibrous Powder    |
| Color               | Grey to White     |
| Solubility in Water | Partially soluble |
| pH                  | 11.5 to 12.8      |
| Packaging           | 25 lbs. sacks     |
| Units per pallet    | 50 sacks          |



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### Testing Data

|                                                        |                      |
|--------------------------------------------------------|----------------------|
| Sample                                                 | 1                    |
| Tap Water, ml                                          | 262.5                |
| VDF SQUEEZE                                            | 37.5                 |
| Concentration                                          | 50 ppb               |
| Push out Test                                          |                      |
| Actual Squeeze Pressure During Spurt Loss              | 400 PSI Differential |
| Actual Squeeze Pressure held constant after spurt loss | 400 psi Differential |
| Spurt Loss, mL (actual)                                | 170                  |
| Fluid Loss, ml/30 min                                  | 220                  |
| Total Fluid Loss, mL/60 min                            | 230                  |
| Calculated Push Out Test Value, ml (x2)                | 460                  |
| Type of Filtrate                                       | Yellow               |
| Filter Cake Size                                       | 20 mm                |
| Strength Test                                          |                      |
| Gauge Reading (max force) lbs                          | 610                  |
| Pressure Reading                                       |                      |
| D=Plug Diameter (in)                                   | 1.024                |
| Cake Thickness (mm)                                    | 20                   |
| Failure Area (in^2)                                    | 2.53387              |
| Force due to weight of free piston                     | 610                  |
| Gravitational Constant                                 |                      |
| F = lbf                                                | 2.20588              |
| Shear Strength (lbs/in^3)                              | 242                  |

### Testing Key Points

- Slot testing will only prove how well a product will plug under low pressure.
- To ensure drilling operations can continue after a squeeze, you need to understand its Shear Stress/Compressibility before breaking down.

**Push Out Test** for preparation of Cake at 400 psi differential pressure and 200 degrees °F across 40 micron aloxite disc. Heat 1 hour at temperature (200°F) before applying squeeze pressure.

**Strength Test at Carver Press** - evenly apply force (brass piston) at 1 pump stroke per 10 sec interval to cylinder. Cake placed inside closed fitted sample holder (cylinder) where it was elevated



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### *Standard Procedure*

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1. Clean mixing pit and lines thoroughly, leave no residual slurry in pit or lines.
2. Add water to mixing pit.
3. Add VDF SQUEEZE to the mixing pit and allow for agitation until homogenous.
4. Add Barite to weight up slurry to desired weight.
5. With the bit at a depth above the loss zone, pump the suggested bbl. of VDF SQUEEZE slurry through the drill pipe with rig pumps at 3-5 bpm to the bit.
6. As the VDF SQUEEZE reaches the bit begin bull heading the slurry out of the bit until all of the VDF SQUEEZE is out of the drill pipe and in the formation of concern. If at any significant increase in pressure is achieved prior to bull heading the recommended volumes into the formation of concern, discontinue pumping, open hydril and pump time a the remaining VDF SQUEEZE slurry as a balanced pill, POOH to above the slurry inside casing and circulate an additional 10 bbls of system mud to ensure the drill string and BHA are clear of any remaining slurry.
  7. It is recommended to never leave slurry inside the Drill Pipe with a jetted bit or any tools in the drill string.
  8. Once pumping of VDF SQUEEZE starts, do not stop pumps until all of the VDF SQUEEZE is out of drill pipe.
9. 7. Shut down for 1 hour and monitor well.
10. Prior to beginning hesitations, check fluid level on backside, if any fluid should be required to fill, obtain accurate fluid volumes required to fill to know the exact location and volume of slurry remaining. Begin hesitations by slowly pumping 5 bbls at ½ to 1 bpm, every 30 - 45 minutes, until desired pressure is achieved. If no pressure is obtained upon squeezing half of the remaining volume of VDF SQUEEZE (50 bbls) into the formation, discontinue pumping and wait one hour.



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### *Weight Up Charts*

**1 bbl. Formulation Table  
Fresh & Sea Water Fluids**

| Density (lbs./gal) | Pounds of VDF Squeeze | Sacks of Barite | Bbls. Of Water or Sea |
|--------------------|-----------------------|-----------------|-----------------------|
| 9                  | 60                    | 0               | 0.93                  |
| 10                 | 60                    | 0.6             | 0.89                  |
| 11                 | 58                    | 1.2             | 0.86                  |
| 12                 | 50                    | 1.8             | 0.82                  |
| 13                 | 48                    | 2.3             | 0.79                  |
| 14                 | 43                    | 2.9             | 0.76                  |
| 15                 | 38                    | 3.5             | 0.72                  |
| 16                 | 35                    | 4               | 0.69                  |
| 17                 | 30                    | 4.6             | 0.66                  |
| 18                 | 28                    | 5.2             | 0.62                  |
| 19                 | 23                    | 5.8             | 0.59                  |

**1 bbl. Formulation Table Oil and Synthetic  
Base Fluids**

| Density (lbs./gal) | Pounds of VDF Squeeze | Sacks of Barite | Bbls. Of Water or Sea |
|--------------------|-----------------------|-----------------|-----------------------|
| 8                  | 55                    | 0               | 0.88                  |
| 9                  | 50                    | 0               | 0.855                 |
| 10                 | 48                    | 1.2             | 0.83                  |
| 11                 | 43                    | 1.8/            | 0.805                 |
| 12                 | 40                    | 2.3             | 0.77                  |
| 13                 | 38                    | 2.9             | 0.745                 |
| 14                 | 33                    | 3.5             | 0.720                 |
| 15                 | 30                    | 40              | 0.695                 |
| 16                 | 28                    | 4.6             | 0.670                 |
| 17                 | 25                    | 5.2             | 0.645                 |
| 18                 | 20                    | 5.8             | 0.610                 |