

TekStem®

Pumpable Grout for Stemming Seismic Blast Holes

TekStem® Field Manual:

- Installation Guidelines
- Certification

TekStem®

Pumpable Grout for Stemming Seismic Blast Holes

Mixing

Batch mixing tanks as used for cement grout preparation are recommended. Open throat progressing cavity (Moyno) pumps may also be used.



Water:Solids	Gallons Water/Bag
3.00:1	18 Maximum, Standard Mix
2.83:1	17
2.67:1	16
2.50:1	15
2.33:1	14
2.17:1	13
2.00:1	12 Minimum

The proper mixing ratio for Tekstem in warm weather conditions (50 degrees F to 100 degrees F) are as follows:

- Combine one 50-pound bag of Tekstem with 18 gallons of water. Fill the mixing vessel with water first, then add the Tekstem powder. Water should be of concrete mixing quality (potable).
- Mix in a suitably sized mixer drum and mix with a paddle mixer at a rate of at least 60 rpm for a period of 3 minutes
- The mix should be consistent, smooth, very fluid and pourable.
- Allow the material to mix thoroughly. After the initial mixing time of 3 minutes, the mixer speed may be reduced to a low agitation speed until the material is to be pumped.
- The set time for Tekstem is one hour, and it is not recommended the material be used if it has sat for longer than one hour as Tekstem will then become too thick to pump and is not able to be placed consistently in the hole to be stemmed.
- In freezing conditions, a reduced water-solids ratio may be appropriate.

For additional information, please contact a Minova representative.



The Minova Logo is a registered trademark.
© Registered trademark of Minova International Limited

TekStem®

Pumpable Grout for Stemming Seismic Blast Holes

Placing

Tekstem can be either poured directly into a shallow dry hole, or if water is present in the hole, pumped into the hole via a hose from the bottom up. For holes greater than 4 meters deep, it is recommended that Tekstem be pumped into the hole rather than poured. Equipment to place Tekstem may include any powered type of piston or progressing cavity grout pump that is capable of pumping at a pressure range of 300 psi to 1500 psi. The equipment should also include a hose of ¾" or 1" diameter of a length to reach to the bottom of any hole that is to be stemmed.

- Pumping should start only after the material has been mixed for 3 minutes, and is of a smooth, homogeneous, and fluid consistency.
- Prior to pumping, insert the discharge hose entirely to the bottom of the hole to be stemmed. This should be at the top point of the detonation charge already placed into the hole. the top of the hole during pumping. The hose can be removed from the hole once the pumping has been stopped at the desired level in the hole.



- If the hole is filled to the top, any water flowing (displaced) out of the hole will turn milky grey, indicating the presence of Tekstem at the top of the hole. Once the material coming from the top of the hole is consistently a grey color, thicker than water and the hose has been withdrawn nearly to the top, pumping can cease and the hose removed from the hole.
- Tekstem placement should start directly on top of the explosive charge at the bottom of the hole, and once pumping has started, the discharge hose should be slowly withdrawn at a rate so that the hose is always submerged near the top of the Tekstem in the hole. Ensure that the end of the hose is immersed in the Tekstem but withdrawn slowly as the level of Tekstem rises in the hole.

- Continue pumping until the desired level of material is in the hole. Any water in the hole will be displaced by the Tekstem and an amount of water (if present) will flow from the top of the hole during pumping. The hose can be removed from the hole once the pumping has been stopped at the desired level in the hole.
- If the hole is filled to the top, any water flowing (displaced) out of the hole will turn milky grey, indicating the presence of Tekstem at the top of the hole. Once the material coming from the top of the hole is consistently a grey color, thicker than water and the hose has been withdrawn nearly to the top, pumping can cease, and the hose removed from the hole.



- In some instances, cracks in the ground, adjacent voids or widening of the hole may be experienced. When this occurs, some Tekstem may flow into these cracks or voids. Leave the hose in the volume of material in the hole, or re-lower the hose to the level of Tekstem already pumped and continue to fill the hole until the surrounding voids are filled and the Tekstem level in the hole once again continues to rise. This may require additional amounts of Tekstem to fill the voids and once the level in the holes begins to rise again, the hole can continue to be filled as normal.
- Any Tekstem remaining in the mixer can be used on subsequent holes, providing the installation will take place immediately after the previous hole. Care should be taken to keep the material from drying out and sitting in the mixer for any period longer than one hour. Material should be re-circulated through the pump and hose to keep from setting up in the hose and clogging the pump equipment.

TekStem®

Pumpable Grout for Stemming Seismic Blast Holes

Clean-Up

Clean up of Tekstem and pumping equipment includes simply flushing the entire apparatus with copious volumes of water until all components are clean. It is recommended that water is continuously placed into the mixer and run through the pump and discharge hose and repeated as necessary until clean.

- The mixer, pump, hose and all other equipment should be flushed thoroughly with clean water to wash out the equipment. Water should be washed through the mixer and pumped through the hose continuously until water coming out of the discharge end of the hose is clear.
- Any clean out points on the pumping apparatus, hose, hose reel, and mixer discharge should be opened and thoroughly flushed with water until clean.
- The mixer, pump or hose may have Tekstem still in their inner-workings. If allowed to sit longer than an hour, the Tekstem may set up, requiring measures other than flushing with water to be necessary. Chipping away of hardened Tekstem may be needed and can be done with a screwdriver, putty knife, hammer, wooden paddle, or any other suitable simple tools that are available. Care should be taken not to cut or damage the hose, or chip at any pumping apparatus or seals that will interfere with the operation of the pump or mixer.



Cure Time

Under standard conditions a cure time of 14 days is required before performing a seismic blast. For additional information please contact a Minova representative.

TekStem®

Pumpable Grout for Stemming Seismic Blast Holes

State of Louisiana Certificate of Approval for Use



BOBBY JINDAL
GOVERNOR

State of Louisiana

ROBERT J. BARHAM
SECRETARY

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF SECRETARY

September 7, 2011

Mr. Bryan Pfaff
Minova USA Inc.
150 Carley Court
Georgetown, KY 40324

RE: Approval of Tekstem for use in Seismic holes

Dear Mr. Pfaff

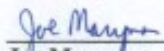
In reference to your letter dated February 17, 2011 requesting approval of Tekstem for use in seismic holes for the prevention of blowouts.

After careful evaluation of the product's ingredients and the TCLP test results your request is approved.

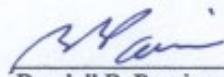
Any seismic company intending to use Tekstem must inform LDWF.

If you have any questions please give me a call (225) 765-2380.

Sincerely,



Joe Maryman
Biologist Supervisor
LDWF Seismic Section



Randall B. Pausina
Assistant Secretary
LDWF Office of Fisheries