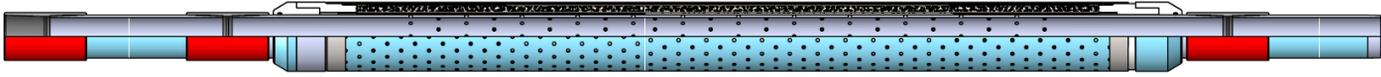


Gravel Pack Joint



Some oil wells will produce sand along with the production of oil. This unwanted sand production is often controlled with screens, slotted liners, and the use of gravel packs. A gravel pack is the term used when a column of sand is placed between the sand controlling equipment (screens and slotted liners) and the sand formation down hole. The silica sand (controlled grain size) is mixed with a liquid and this slurry is then pumped down the well to fill the annulus required. The gravel pack acts as a filter media, which will filter some of the fines before it reaches the sand control equipment. This process has reduced the amount of sand produced at surface on sand bearing wells.

The sizing of silica sands is determined from a sieve analysis, obtained from formation core samples, as well as the filter size and type of sand control equipment to be run in conjunction with the gravel pack. Once the silica sand size is determined, it is pumped down the well on the outside of the sand control equipment within the annular. On horizontally drilled wells, the pumping action does not necessarily place the sand evenly in the annulus on wells with angles greater than 65°. Placement in wells with greater angles than 65° typically places the silica sands on the bottom of the annulus and not on the top area of the annulus.

The Gravel Pack Joint (GPJ) is manufactured on surface before running in the well. The purpose of the GPJ is to eliminate the pumping of silica sands into the well, which can lead to poor or improper placement of the silica sands. The GPJ will also contain one more sand control media then the gravel pack being pumped. Pumped gravel packs create sand control with the silica sand and the sand control equipment (2 medias). The GPJ has an outer sand control liner, an inner sand control liner—each having different medias—and the silica sand (3 medias). The GPJ is manufactured with the inner sand control liner containing an opening size designed around containing the small formation sands. The outside slotted liner's slot size is designed around containing the large formation sands. These two opening sizes are also designed to contain the silica sands (in both directions) that will be placed and contained between the two sand control liners. The GPJ assembly will contain a smaller liner (e.g. 5 1/2") inside a larger liner (e.g. 7") held together with special subs on both ends, then the silica sand is placed between the 2 liners. Assembly is done in the vertical position with the aid of vibration to eliminate any voids within the placed silica sands.

APPLICATION

- To be used in any vertical or directionally drilled wells where sand control would be required.
- To be used in directionally drilled wells greater than 65° angles.

FEATURES

- Does not require silica sand slurry pumping and placement into the well.
- Provides three or more different sand control media vs. the conventional 2 different media types.
- No voids or partial well coverage of the gravel pack in the well, when using the GPJ.
- Gravel pack can be removed from a well if required.

BENEFITS

- Total coverage of gravel pack throughout the well with no pumping.
- Better sand control using more sand control media.
- More economical to run without pumping the placement of the gravel pack.



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