TAM INTERNATIONAL

Using High Temperature Swellable Packers to Direct Steam Injection in SAGD Wells
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Abstract
For the last two decades major oil companies in Canada have been focused on developing heavy oil resources. Heavy oil development has expanded significantly due to favorable oil prices and improved technology to achieve higher recovery factors for heavy oil (up to 60% of the oil in place). Steam injection is the most common technique to heat up the formation and improve oil mobility using technology known as Steam-Assisted Gravity Drainage (SAGD).

Steam injection technology has evolved over several years but operators are generally unable to address many challenges impacting their well economics. Quite often, older wells encounter issues of steam channeling between injector and producer well pairs with steam often breaking through to a nearby producer well. When this occurs, oil production is typically reduced significantly and overall production efficiency declines rapidly. Reduced oil production and increased steam breakthrough can have a significant negative effect on the economics of a well. Controlling steam injection and its distribution to achieve economical ultimate recoveries has been a continuous challenge for heavy oil producers.

High-temperature swellable packers have been developed to facilitate, control and optimize the placement of steam in heavy oil reservoirs. Current elastomer technology is available to meet the high temperature (up to 575°F / 300°C) and high differential pressure requirements associated with steam injection operations. These elastomers are available for swelling in applications requiring either oil or water.

This paper presents a completion solution for SAGD wells which can reduce wasted steam injection at the toe section of the well and remediate steam breakthrough problems. The installation of high temperature swellable packers in these completions allows for uniform distribution or selective placement of steam along the entire length of horizontal section and provides a simple and reliable means of controlling steam injection.

Contact TAM for the complete paper.