



SUCCESS STORY

# Vallourec Tube-Alloy

## THERMOCASE® VIT™ a SAGD Success Story in Canada

### Overview

Starting in 2009, many E&P companies developing the heavy oil sands of Alberta, Canada, were looking at various ways to improve the overall oil production in Steam Assisted Gravity Drainage (SAGD) applications.

### Challenge

The success of SAGD, an in-situ enhanced oil recovery process, relies on a dual well design, which includes an injector and a producer. Steam is piped down the injector into the toe and heel of the horizontal well where the steam heats the bitumen. As the bitumen warms up, the viscosity of the oil is decreased. The oil then drains into a slotted horizontal liner located directly beneath the injector. The slotted liner allows the oil to flow into the producer where it is brought to the surface for refining.

One of the primary inefficiencies in current SAGD technology is that once the steam is injected into the top of the well, heat is lost to the surrounding annulus and formation, and transforms into condensate. Water in its liquid state does not efficiently travel through the oil sand, causing lower oil recovery rates.

### Solution

THERMOCASE® Vacuum Insulated Tubing (VIT™) is the highest performing, double-walled tubular product available. It consists of concentric inner and outer tubes, welded at the ends and threaded with conventional premium threads such as VAM®, with the annular space insulated and vacuumed to provide the highest level of thermal insulation available.

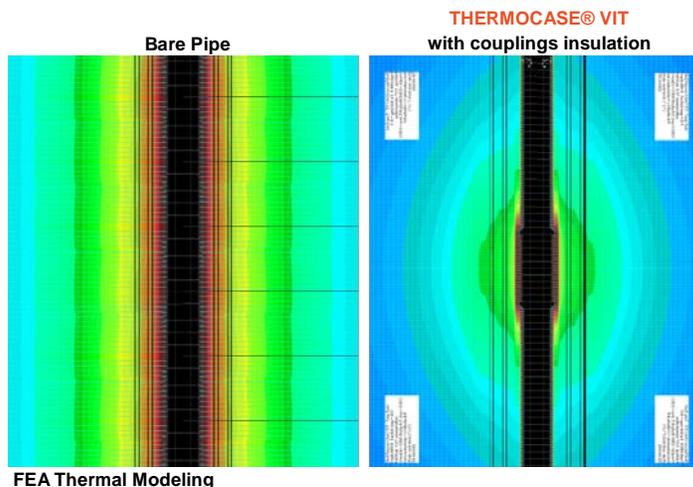
Vallourec Tube-Alloy's THERMOCASE® VIT™ insures that the steam injected into the well remains in its state, and does not condense into a liquid like with previous solutions employed. THERMOCASE® VIT™ holds the heat inside the production tubing, resulting in higher quality steam traveling into the reservoir, which in turn increases the rate of production.

Vallourec Tube Alloy has a proprietary thermal modelling software to calculate the k-value (the amount of BTUs conducted per degree fahrenheit per foot per hour). Bases of the model can be found in the technical paper SPE 90151.

### Benefits/ Results

Before implementing THERMOCASE® VIT™ in their well design, an operator in Canada claimed initial production rates of 500 to 600 barrels per day (bpd) per well pair. After utilizing THERMOCASE® VIT™ in the vertical section of both the injector and producer wells, production rates increased to 800 to 1000 bpd per well pair, which in many cases doubled production rates. In addition, another operator recently claimed that the initial results from implementing

THERMOCASE® VIT™ in several test wells indicated that it paid for itself easily in the first year of production. SAGD operators using THERMOCASE® VIT™ should see a significant long term increase to their bottom line, since most SAGD wells have a life expectancy of 7-10 years. Many existing SAGD operators are enjoying the economic benefits after incorporating THERMOCASE® VIT™ into their injection string designs.



FEA Thermal Modeling

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