

# VISCOpro 2000 measures polymer brine concentration at low shear conditions



## RESULTS

- Measured viscosity at very low shear rates
- Demonstrated a good correlation to data obtained by a lab rheometer in the range of 127-1000 sec-1
- Enabled customer to pursue long-term goal of increasing yield



## APPLICATION

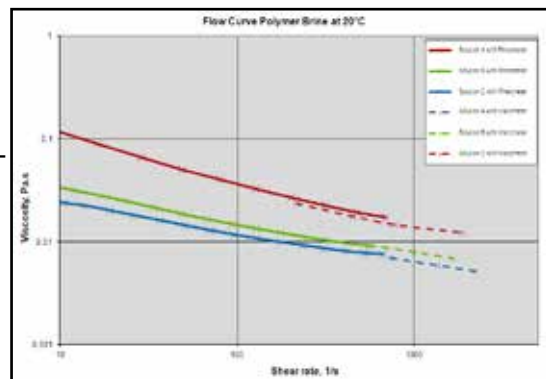
Online viscosity measurement of polymer and brine for offshore enhanced oil recovery.

## CHALLENGE

An oil-field customer wanted to increase the long-term yield at a particular off-shore field and increase profitability. Their plan was to inject polymer mixed with brine into the well as part of an enhanced oil recovery project, with the goal of increasing oil production by 38%. Their plan was to inject polymer mixed with brine into the well as part of an enhanced oil recovery project, with the goal of increasing oil production by 38%. To be successful, they needed to make sure the brine solution was mixed to the right concentration. However, testing for consistency was challenging because the solution broke down when it was exposed to air. Their existing solution consisted of a laboratory rheometer installed in a large vacuum chamber that enabled testing, but it required manual intervention, and it took up significant space on the rig.

## SOLUTIONS

PAC eliminated the need for the rheometer and the vacuum chamber on the rig with a Cambridge Viscosity VISCOpro 2000 viscometer with SPL-393 sensor. The unit was calibrated with three ranges (2.5-50, 5-100, 25-500), each having three to four shear points, or calibrated drive forces. Having these different drive forces allowed PAC to measure a given polymer at multiple shear-rates and then compare it with the lab rheometer results. The results showed an excellent correlation to data obtained by a lab rheometer in the range of 127-1000 sec-1.



The VISCOpro 2000 is the only in-line viscometer that measures low-shear conditions. This was important for the application because polymer chains break down under high shear. It was necessary to maintain the shear rate within a range that overlapped with that of the rheometer, so a correlation between the data sets could be established.

The VISCOpro solution was successful at six different concentrations of brine at various shear rates, and enabled the customer to pursue their long-term objective to increase the yield of the well.

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