



CAPCIS Wax Capability



With the use of advanced modelling software, a co-axial shearing deposition test rig and in-house expertise Capcis can:

- Evaluate the potential for wax formation
- Model the location, rate and equilibrium deposition thickness
- Estimate the required pigging frequency
- Evaluate the efficacy of wax inhibitors
- Carry out site measurements of the efficacy of pour point depressants

MultiFlash with FloWax module.

The FloWax software developed by Infochem and used by Capcis has five main features that allows the user to model wax deposition in pipelines:

- Thermodynamic wax model
- Compositional wax model
- Heat and mass transfer
- Shear removal
- Fluid flow model

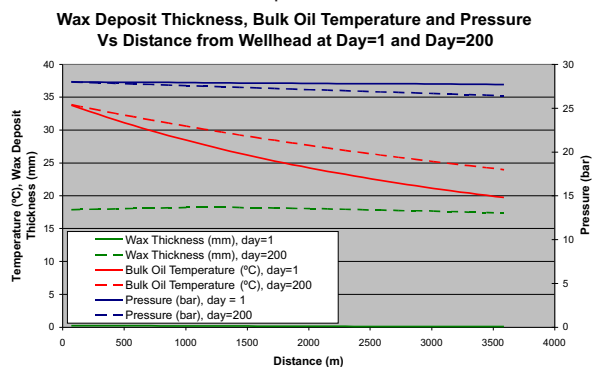
The models give good predictions of waxing behavior, both wax appearance temperature and the amount of wax precipitated at different temperatures.



FloWax will estimate pigging interval according to a number of criteria



The following chart shows conditions of temperature, pressure and wax deposited based on a real world example:



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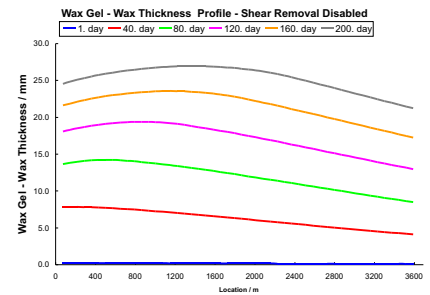
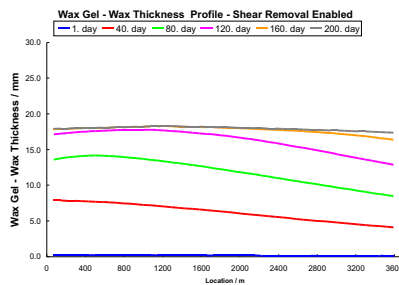
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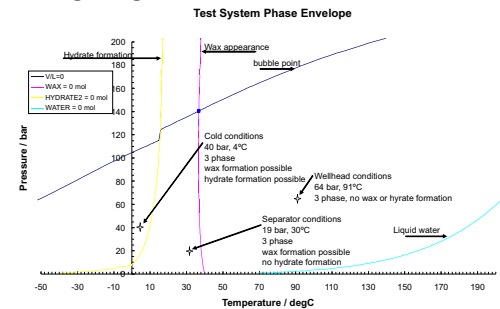


Advanced Modelling

The use of MultiFlash™ advanced multi-solid model allows complex phase diagrams to be constructed where the formation of more than one solid presents a potential flow assurance problem. The following diagram shows:

- The aqueous dew point
- The bubble point
- The wax appearance conditions
- The hydrate formation conditions

Onto these diagrams can be projected system conditions to determine at a glance the potential for liquid water, solid wax or solid hydrate formation.



Should the system fall within one or more of these conditions further studies may be required.

The information obtained from the system modelling can be used to determine the worst case deposition conditions within a pipeline. These conditions can be used in the co-axial shearing deposition cell when testing the efficacy of wax inhibitors on crude oils.



The Capcis co-axial shearing deposition cell can be used to evaluate the performance of wax inhibitors under system conditions of shear and differential temperature. The use of a high pressure cell allows the use of live crude oil samples, where available.

Wax is deposited on the bobbin as a function of shear and temperature differential between the bulk oil and the bobbin. Tests are used to evaluate the efficacy of wax inhibitors, the effect of shear and differential temperature between the pipeline wall and the bulk oil.

