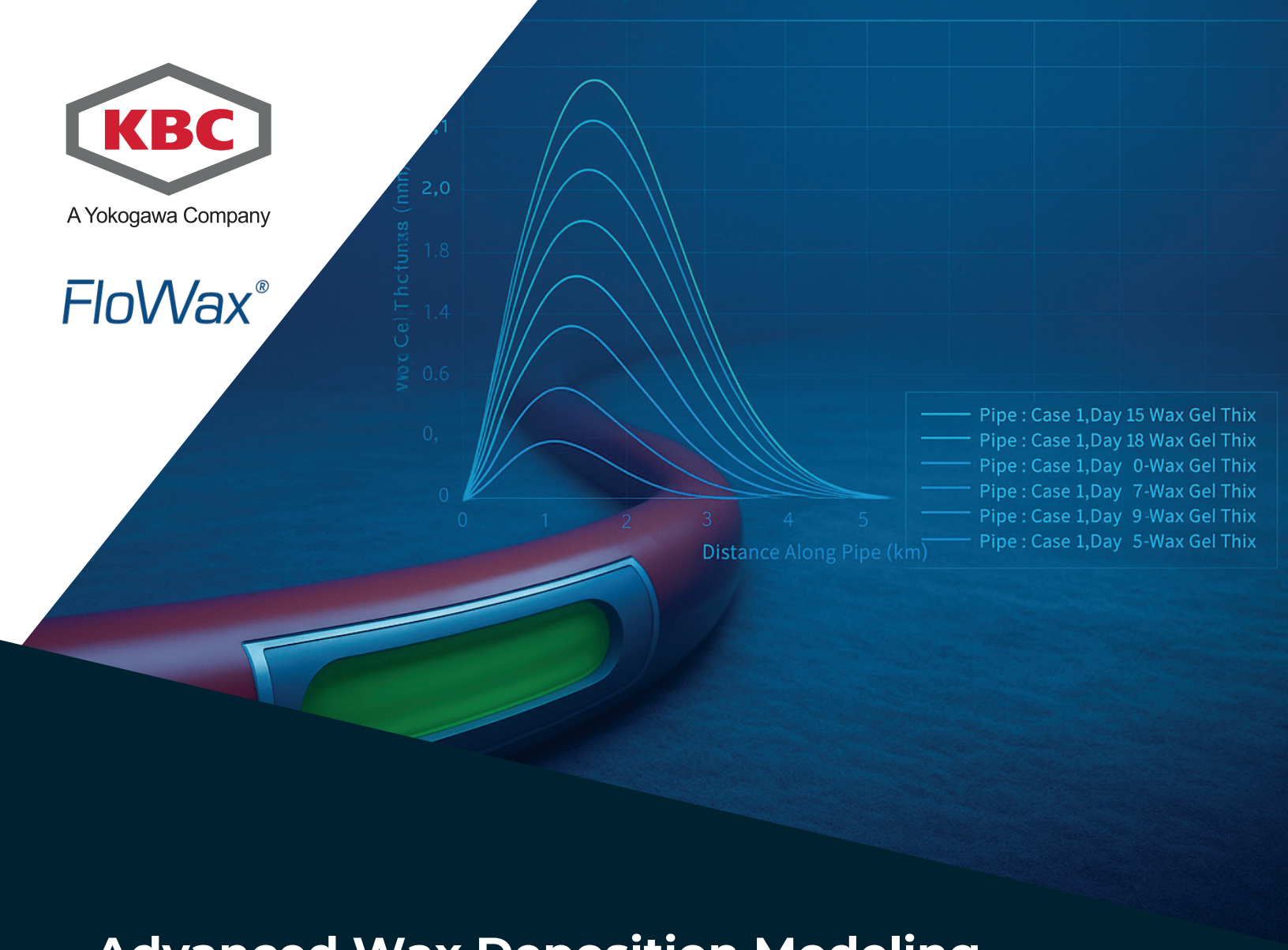
KBC

A Yokogawa Company

FloWax®



Advanced Wax Deposition Modeling for Flow Assurance

FloWax® is an advanced simulation application that gives engineers clear, actionable insight into when, where, and how wax will form long before it impacts oil and gas production systems.

To achieve this, FloWax is powered by the industry's leading Maximus® thermo-hydraulics and Multiflash® wax thermodynamics software. By combining rigorous physics with field-realistic wax modeling, FloWax helps engineers make decisions with confidence.

As a result, pigging frequency can be optimized based on accurate wax deposition rates. This helps engineers avoid overly conservative designs while preventing costly production losses or facility damage that can reach USD 25 million per year.

Bringing **DECARBONIZATION** *to Life*®

Accurate, Physics-Based Prediction

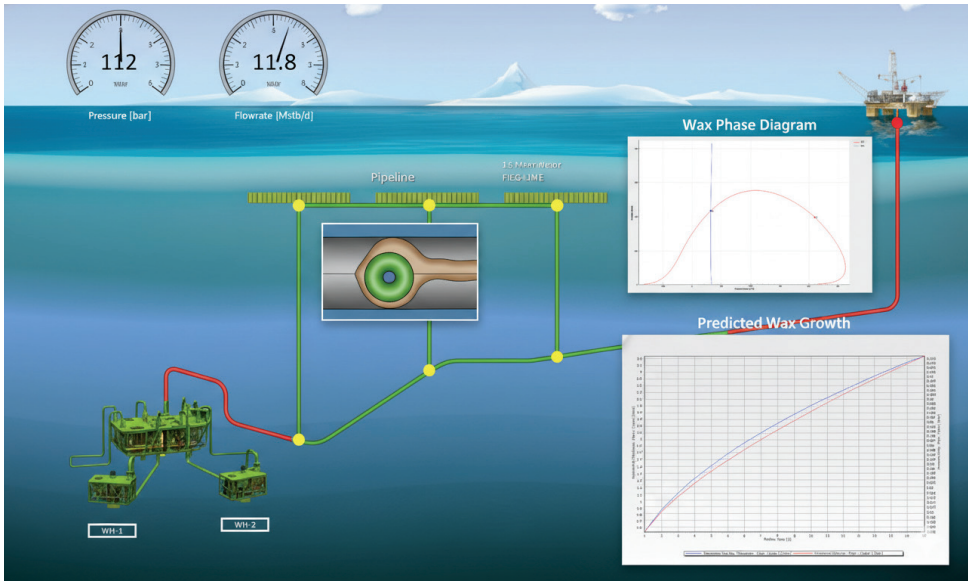
How confident are you that your wax predictions still hold as operating conditions change?

Accurate wax prediction starts with physics—not assumptions—so engineers can trust results under real operating conditions.

FloWax combines rigorous heat, momentum, and mass balance calculation with mechanistic wax-deposition modeling and advanced wax thermodynamics from Multiflash. Together, these capabilities deliver reliable deposition forecasts under real operating conditions.

FloWax evaluates wax precipitation relative to the Wax Appearance Temperature (WAT) to pinpoint where and when wax deposit will form. By accounting for temperature gradients, flow regimes, fluid composition, and other operational parameters, the model provides a complete picture of how wax formation evolves along the system.

The application leverages the Coutinho solid-solution model within Multiflash to calculate the thermodynamic driving force for wax crystallization, combined with a mass-transfer wax-deposition model to represent deposit formation. This approach ensures laboratory accuracy in field-scale prediction.



Combining heat, momentum, and mass transfer with thermodynamic modeling for field-accurate wax prediction.

Integrated with Industry-Leading Simulators

FloWax models multiphase flow across single or complex pipeline networks. It enables engineers to define pipeline geometry, wall materials, elevation profiles, and heat-transfer conditions for realistic simulations. Additionally, they can import experimental and simulated flow-profile data to reflect actual operating environments.

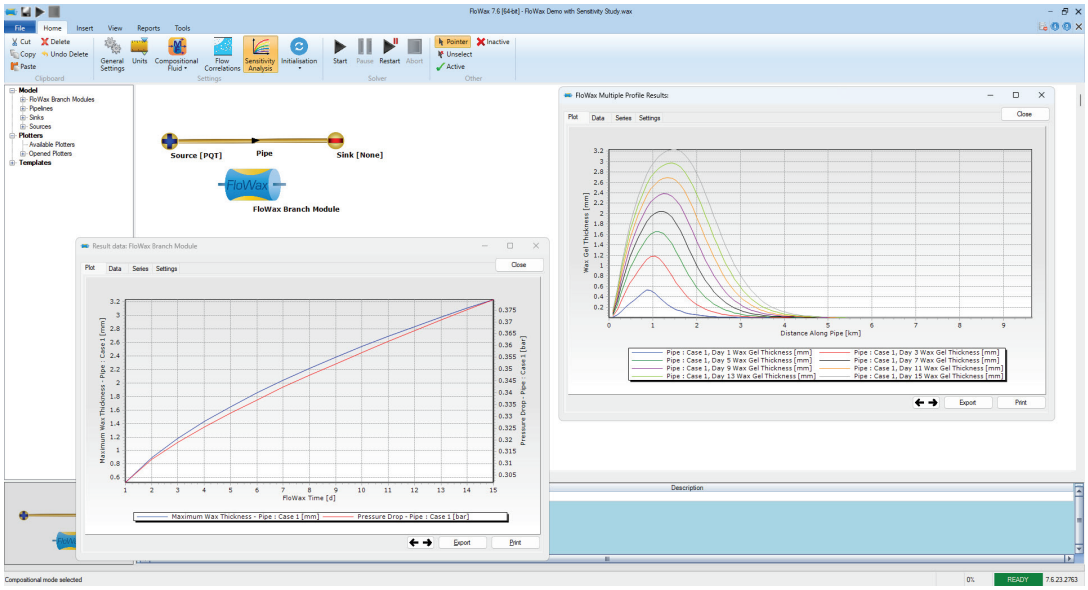
By integrating FloWax with Maximus' life-of-field modeling capabilities, engineers can predict how wax-deposition risk evolves over the asset's lifecycle as the reservoir depletes and operating conditions change.

The solution also provides visibility into velocity profiles, liquid holdup, and key fluid properties such as density, viscosity, and temperature along the pipeline. It supports advanced flow correlations and third-party models such as OLGAS® to ensure compatibility with existing flow-assurance workflows.

Operational Efficiency and Cost Savings

By identifying wax deposition zones and optimal pigging intervals, FloWax reduces unnecessary maintenance, prevents flow restriction, and extends production uptime.

Simulation results are displayed through trend plots and tabular outputs. With one-click export for deeper analysis and reporting, engineers can turn modeling data into actionable insight. FloWax helps prioritize interventions so maintenance activities can be planned where they matter most.



Multiphase flow simulations account for heat transfer, geometry, and flow regime dynamics.

Where is wax actually forming, and how confident are you in that answer?

For flow assurance engineers working in subsea tiebacks, wax prediction can be a blind spot. FloWax models real-world fluids so engineers can act with confidence, even under changing operating conditions.

Wax behavior is modeled using detailed hydrocarbon composition data—including n-paraffin distribution and molecular-weight variation—to replicate actual field conditions. Users can import Multiflash PVT files or laboratory data directly for accurate fluid representation and reliable field-scale results. Sensitivity analyses test how flow rate, temperature, or wax-layer properties affect deposition and pigging frequency.

Deposited wax layers are treated as a composite of wax crystals and trapped oil. Engineers can tune porosity, gel strength, thermal conductivity and mass-transfer coefficient to match field data, replicate pressure drop field data and the shear effect of high-flow rate. The effect of wax aging is also included to improve realism and match long-term field behavior.



Ideal For

- **Flow Assurance Engineers** - Assess and control wax deposition in subsea or onshore flowlines.
- **Production Engineers** - Optimize production strategies by predicting wax-related restrictions.
- **Pipeline Integrity Teams** - Determine safe pigging frequency and pressure-drop thresholds.
- **R&D and Laboratory Teams** - Validate field data and tune wax-model parameters.
- **Consultants and EPCs** - Integrate wax prediction into design and project planning phases.

Why FloWax

FloWax combines fluid characterization, flow modeling, and wax-deposition prediction in one cohesive platform powered by Multiflash thermodynamics and Maximus flow simulation.

By unifying rigorous physics with field-realistic modeling, FloWax enables faster, data-driven decisions that improve reliability, reduce costs, and extend system uptime while Bringing Decarbonization to Life®.

Market Problems	Product Features
Predictive Wax Deposition Modeling	
Unexpected wax build-up restricts flow and causes production loss.	Forecasts wax location, thickness, and volume along the pipeline using coupled thermo-hydraulic and thermodynamic models.
Pigging Optimization	
High-frequency pigging leads to maintenance costs and deferred production.	Calculates ideal pigging frequency and conditions to minimize intervention while maintaining flow integrity.
Detailed Fluid Characterization	
Limited understanding of wax formation due to incomplete fluid data or inaccurate modeling approaches.	Uses Multiflash accurate PVT models and lab-measured wax properties to replicate field conditions with precision.
Integrated Platform	
Fragmented data across modeling tools reduce consistency and accuracy.	Seamlessly combines Maximus flow simulation and Multiflash thermodynamics in a unified environment.
Shear Removal Modeling	
Inaccurate deposition trends under turbulent flow impact operational planning.	Accounts for wax ablation and re-entrainment effects in high-velocity flow regimes.
Open Interface	
Poor connectivity with data sources and other applications cause delays and limitations in engineering assessment, leading to poor decision-making and lack of agility.	FloWax integrates with data platforms through the EXCEL® interface or the OPC data historians connection through Maximus. Full access to the API (Application Programming Interface) allows seamless automation of workflows for improved agility and efficiency.