How RESMAN delivers value: from design to answers

Step 1 • Design and manufacturing
RESMAN Intelligent Tracers are custom-designed to achieve specific well monitoring objectives. Each system design is based on specific project conditions, such as:
• Well trajectory and completion design
• Downhole temperatures
• Oil properties
• Flow rates at the sampling point (short- and long-term)
• Fluid and chemical exposure during the life of the well
• The operator’s monitoring objectives
This design process ensures RESMAN Intelligent Tracers are custom tailored to achieve maximum performance in each customer application.
RESMAN also has tested a large variety of oilfield chemicals to determine if they interfere with detecting the tracer molecules during analysis or if they damage the solid tracer matrix. Tested fluids include HCl and HCl-HF acids, commonly used completion and drilling fluids (brines, muds, breakers, frac fluids, xylene, etc.), asphaltene, hydrate, corrosion and scale inhibitors.
The Intelligent Tracers are manufactured at RESMAN’s headquarters in Norway using a robot-based process (Fig. 1).

Step 2 • System Integration
The Intelligent Tracer systems are integrated into the completion hardware at the manufacturing facility of the completion provider selected by the customer. The integration into screens (Fig. 2) or pup joints is performed by specially trained RESMAN personnel.
RESMAN personnel stencil a unique serial number on every joint (Fig. 3). This information is integrated into the completion running procedure to make sure each system is deployed in its proper location.
The simplicity of system integration eliminates the need for additional personnel at the well site and significantly reduces operational risk.
Step 3 • Well completion by operator
The completion components containing the RESMAN Intelligent Tracers are run in hole by the completion personnel who are already scheduled to be on site. No RESMAN personnel are required at site for the completion operation.

Step 4 • Fluid sampling
A RESMAN Tracer Survey Analyst is assigned to work closely with the operator to build tailored sampling programs and perform the data analysis for both transient and steady state flow regimes.

Using a detailed and easy-to-follow procedure and sampling kit (Fig. 4) provided by RESMAN, the operator’s on-site personnel collect production fluid samples and send them to RESMAN’s laboratory in Norway. This method is cost-efficient, since it reduces the need for additional personnel at site, and has been implemented in RESMAN projects worldwide with thousands of successful analyses performed to date.

Step 5 • Data analysis and modeling
RESMAN’s laboratory personnel perform the proprietary analysis at the company’s headquarters in Norway. Their extensive experience handling the logistics of the samples achieves a reasonable turnaround for complex laboratory analysis and data modeling – usually two weeks from the date the samples are received in Norway.

After the samples are analyzed, RESMAN sends the results to its Tracer Survey Analyst assigned to the project. Tracer Survey Analysts are part of a dedicated data modeling and interpretation team composed of reservoir engineers, chemists, and completion engineers.

This team has extensive experience in inflow profiling with Intelligent Tracers and developed proprietary analytical models to provide quantitative inflow distribution results.

RESMAN has verified the accuracy of these models with full-scale, flow-loop testing performed with two major operators, Statoil and Eni.

Experts in every stage of the project
Over the years, RESMAN’s expertise has been built by designing and managing the implementation of Intelligent Tracers in the most complex and challenging completions in the oil and gas industry (70% of systems are installed in subsea and deepwater completions).

Upon award of a project, a Project Engineer (PE) is assigned to the operator. RESMAN PEs work closely with their operators to ensure proper system design, timely delivery and execution, fulfillment of monitoring objectives, and recurring data analysis. They also coordinate the synergy between dedicated teams of experts that are responsible for system design and manufacturing, logistics, lab analysis and data modeling.

RESMAN recognizes the importance of extracting value from the data throughout the life of the monitoring systems. Accordingly, the assigned Tracer Survey Analysts work closely with the operators from system design, data interpretation review, action planning, and recurring analysis campaigns for the life of the RESMAN Intelligent Tracers.