



SNF
WATER SCIENCE

EOR by Viscous
Water Injection

MAXIMIZING OIL RECOVERY WHILE REDUCING CO₂

Giving your Reservoir a Second Life

Increasing your Reserves

In most fields, the oil recovery factor remains low, with an average of only 30% of the original oil in place (OOIP) being produced at the end of field life.

There are various techniques to enhance oil recovery, the most common being polymer flooding. It is a field-proven technology with more than 350 successful projects worldwide. Injection of viscous water into the reservoir increases the sweep efficiency and mobilizes the by-passed oil. This leads to faster and higher oil recovery with up to 25% increased recovery factors.

Recovery factor
increased by
up to 25%
of the OOIP

A Proven Technology

EASY TO IMPLEMENT, PROFITABLE AND SUSTAINABLE



INCREMENTAL OIL

Recovery factor increased by up to 25% of the OOIP.



WATER CONSUMPTION

3 times less injected water,
3 times less produced water.



CARBON INTENSITY

Reducing CO₂ emissions per barrel by 3-6 times.



COSTS PER BARREL

Maintaining combined OPEX and CAPEX at \$3 to \$6 /bbl.



FASTER RECOVERY

With the acceleration in the recovery of oil, several years of water and energy consumption are avoided.



ANY RESERVOIR

From Greenfields to mature reservoirs.

ENHANCED OIL RECOVERY

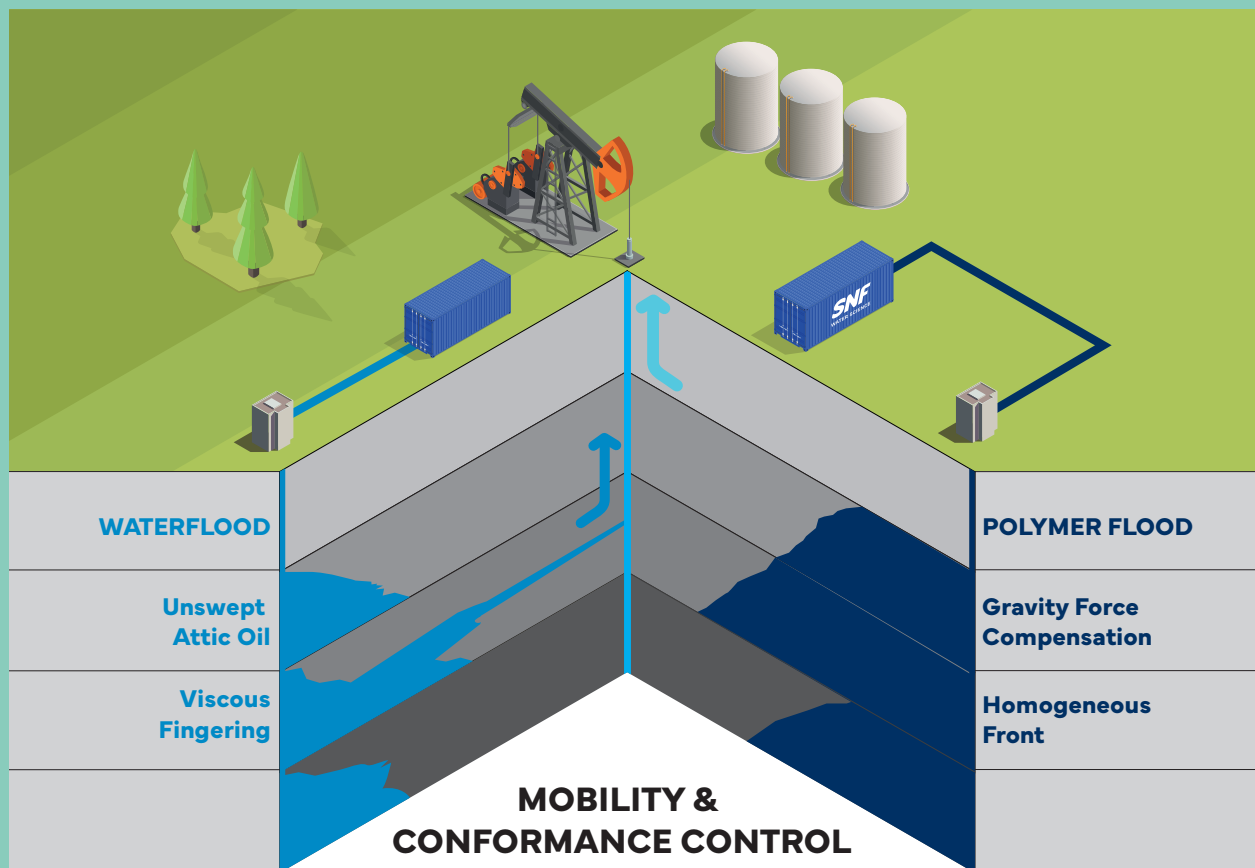
Polymer Flooding

Nothing but a Viscous Water Flood

Reservoir engineering principles indicate that waterflooding may rapidly lose effectiveness in cases where the reservoir exhibits heterogeneity or when the viscosity of the oil significantly exceeds that of water. After water breakthrough happens, addressing the issue becomes difficult, often making operations inefficient

and eventually uneconomic.

Adding polymer to the injection water increases displacement and sweep efficiency. Water breakthrough is delayed, **oil recovery and reserves are increased** and the whole process becomes more efficient.



Higher Recovery, Lower Water Cut

Polymer flooding homogenizes the flood front while sweeping previously bypassed layers. This is especially important in heterogeneous reservoirs with thief zones. Higher reserves, higher recovery factor, accelerated production, lower water-cut, improved operations CO2 footprint: these are the benefits of polymer injection.

OUR KNOW-HOW

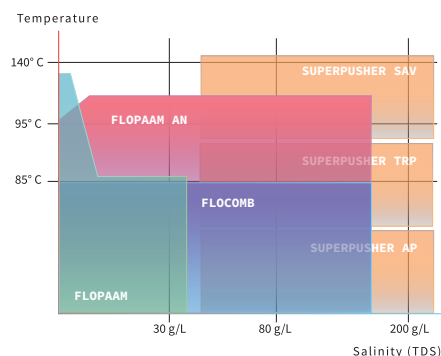
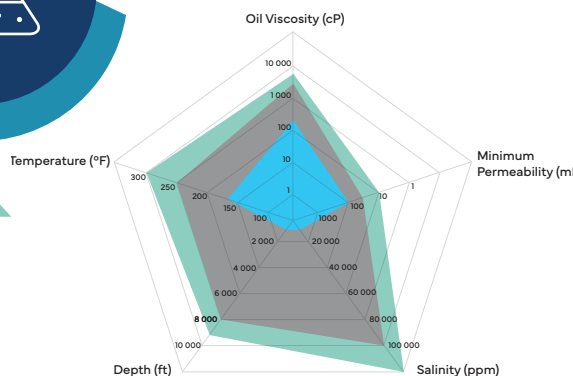
An Integrated Approach

Combining the capabilities of a leader in polymer manufacturing and a team of 150 oil & gas experts with an integrated engineering department, SNF will be your single point of contact, eliminating unnecessary steps.

SNF combines the services of selecting and providing the right chemistry with a specifically designed surface facility. This way the optimum way to deploy and apply the technology will be guaranteed and the highest performances under the responsibility of one company can be delivered.



Chemicals



Over the past decades, polymer flooding has matured tremendously. The subsurface mechanisms are better understood, and the chemistry has evolved and improved, especially with the introduction of fluorinated monomers and new chemical technologies.

Now, SNF provides polymers for cold to hot, permeable to tight, fresh to saline, and shallow to deep reservoirs.

SNF can tackle any geology (sandstones, carbonates) and oil reservoir (from light to medium and heavy oil) with our wide range of polymers.

SNF provides the full range of laboratory services for polymer selection and project assessments. Specifically, rheology, thermal stability tests and core floodings evaluations, to name a few.



Engineering

Over the past 20 years, SNF has gained extensive experience in managing EOR projects on a global scale. It has demonstrated its ability to provide complete engineering packages to support the technology. This includes the polymer process, with alkali and surfactant handling systems if required, water treatment devices, site constructions, oil and water separation, and treatment units..

SNF has developed a complete range of pre-engineered polymer injection units (PIUs) based on patented PSU technology and other proprietary equipment, such as horizontal silos and in-line viscometers. The modular deployment strategy has been encouraged and optimized to enable fully integrated technology development, from polymer injectivity testing (pit), pilot phase(s), and full-scale and field results as cost-effectively and sustainably as possible.



Services

Apart from the chemistry and surface facilities, SNF also provides services related to reservoir/field assessment and selection, including assistance with modeling and simulations, project management, procurement, commissioning, start-up, operator training, O&M assistance or direct management, performance monitoring, and results interpretation.

So, in conclusion, SNF takes care of everything related to polymer flooding projects. This global approach allows our customers to deal with a unique partner and benefit from an extensive performance guarantee – all from one company!





SNF Andrézieux site in France, one of the 21 manufacturing plants of the SNF group.

WHAT MAKES US DIFFERENT

Why Choose SNF

Backed by world-class equipment and engineering support, qualified applications specialists, efficient manufacturing of quality water-soluble polymers, and optimized supply chain management, SNF is a recognized leader in developing high-performance chemical solutions designed to exceed the needs of our customers in the Oil & Gas Industry.

Worldwide Leader

With 21 production facilities and subsidiaries in more than 50 countries, the SNF Group is the world's leader in water chemistry.

30 Years of Experience in Oil & Gas

Over the last 30 years, SNF has acquired a solid understanding of clients' needs in oil fields. Combined with polymer expertise, we offer complete engineering systems to optimize injection for polymer flooding applications.

Polymer Manufacturer

As a global leader in the manufacturing of water-soluble polymers, SNF continuously improves a range of more than 1,000 products, which helps reduce energy needs and carbon intensity while contributing to the responsible extraction of key mineral resources essential to the energy transition.

Fully Integrated Company

SNF is a fully integrated company. We have channeled all of the supply chain to be internal - from research and development to production, from your equipment design to its installation.

150 Oil & Gas Experts

We are engineers, developers, technicians, and oil and gas experts who strive to solve your challenges. Together, we aim for excellence in every step, from the first on-site audit to your staff training.

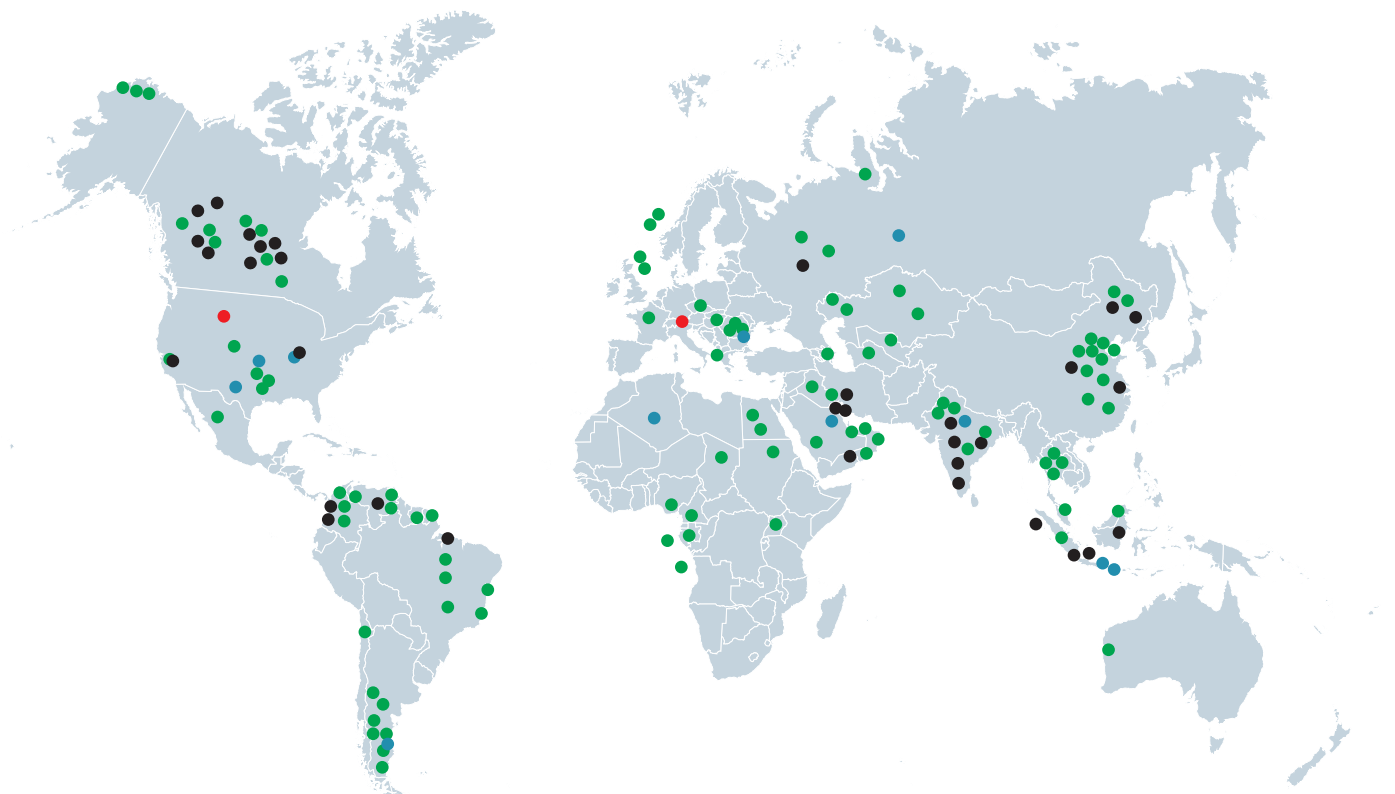
Industrial Strike Force

SNF polymers are manufactured in 21 plants covering 5 continents, allowing us to provide polymer solutions to the Oil & Gas Industry cost-effectively and energy-efficiently.



EXPERTISE **Field Proven Technology**

OVER 350 EOR PROJECTS (PF, SP, ASP, AP) WORLDWIDE OVER THE LAST 20 YEARS



- PF: Polymer Flooding
- ASP: Alkaline Surfactant Polymer
- SP: Surfactants Polymer
- AP: Alkaline Polymer

Responsible Chemistry

With 21 production facilities and subsidiaries in more than 50 countries, the SNF Group is the world's leader in water chemistry. As a leader in our industry, we are responsible for addressing the planet's environmental challenges by going further and working faster to strengthen water chemistry's ethical dimension.

SNF Responsible Chemistry reflects SNF's goal of being one of the most exemplary chemical producers in terms of environmental footprint. This defines our ambition and strategy for the climate.

At SNF, we are committed to ensuring that these drivers are more than just messages. They are part of the Group's DNA and give meaning to our actions. That is why we have been a member of the UN Global Compact since 2008. We are committed to the ten universal principles of the initiative.

