



Oil Recovery – Slop Oil

Lucent Emulsion Treatment

Demulsifier for purification of slop oil and bilge water

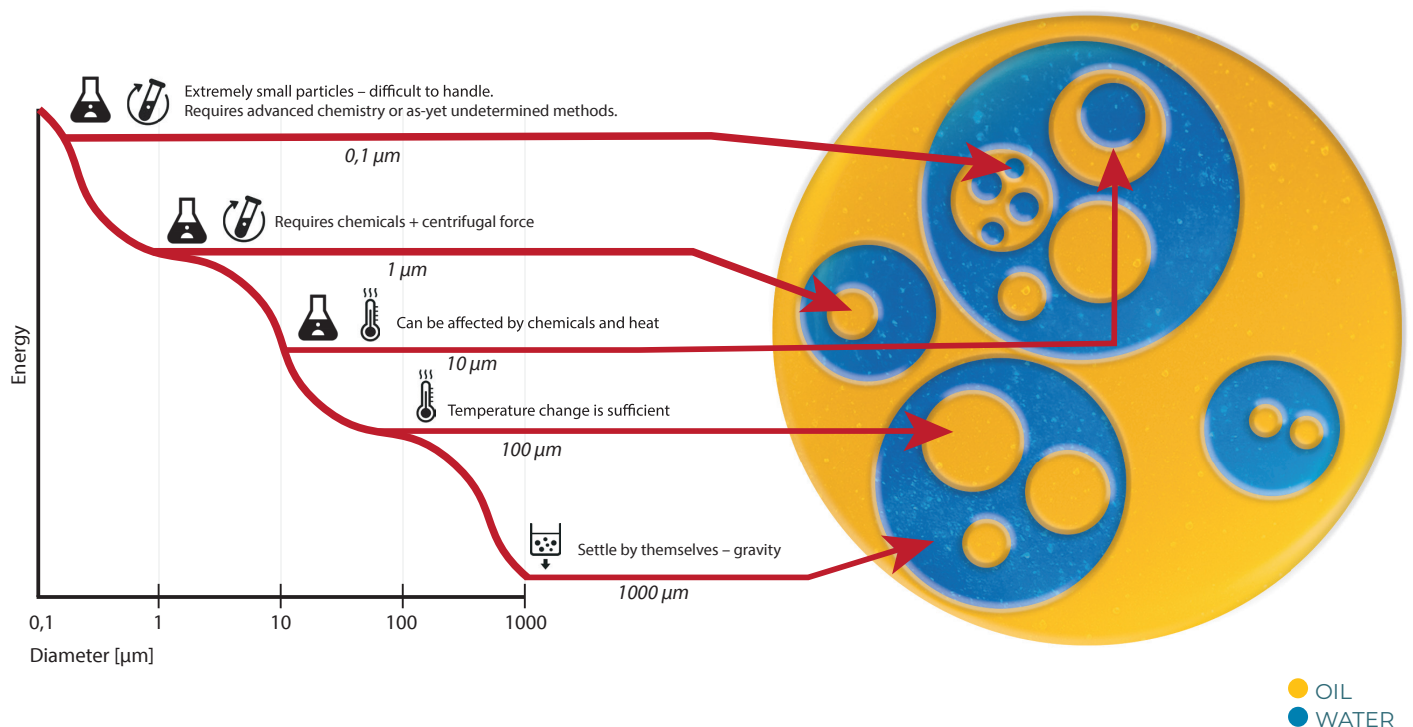


Water in Emulsions

Crude and refined oils (RFO/HFO) often contain solid contaminants such as iron sulphides, clays, silts, paraffins, asphaltenes, and organic acids. In the presence of water, these particles tend to concentrate at the oil–water interface due to high interfacial tension.

This leads to water droplets becoming coated, which sterically hinders coalescence into larger, separable droplets. Shear forces and pressure fluctuations in equipment like pumps and valves further stabilize these emulsions, making them so persistent that natural oil–water separation becomes nearly impossible. However, with the right combination of time, elevated temperature, targeted chemical additives, and mechanical treatment, even the most stable emulsions can be effectively broken. This enables efficient separation of oil and water, restoring the oil's usability and reducing waste handling costs.

Microscopic image showing distinct droplets of water and oil. Water droplets appear spherical and refract light differently due to their higher surface tension, while oil droplets typically exhibit lower interfacial tension and a softer outline.



Emulsions contain droplets of varying sizes and energy levels. Larger droplets settle easily, especially at higher temperatures. Smaller droplets require a chemical demulsifier, while the most stable emulsions need high-speed centrifugal separation as well.

Verified Results in Production

Properties of Lucent Emulsion Treatment primarily involve separating water and solid contaminants from the oil phase.

- Disrupts emulsion stability – Flocculating Surfactants and Polymers break down surfactant- and particle-stabilized emulsions.
- Creates an oil free water phase – essential for downstream water treatment or disposal.
- Workplace safety and sustainability – water soluble formulation reduces operator-exposure to hazardous fumes and ensures minimal environmental impact.

What Sets Lucent's Demulsifier Apart?

Broad Operational Temperature Range

Active from room temperature and up, ensuring robust results across varied conditions.

Advanced Wetting Agents

Lower surface tension to support droplet growth and settling

Faster Phase Separation

Quicker and more efficient oil-water separation



Integrated Expertise for Full-Process Solutions

Lucent's chemical innovation is further enhanced through strategic collaboration with Head Engineering Group, combining surface chemistry with mechanical treatment technologies for best-in-class separation performance.

Case Study - Oil Recovery Plant

Phoenix Collector OY, Hamina Finland



Since 1996, Phoenix Collector is a company specializing in oil recovery. The company is active in the areas of slop oil and sludge collection (MARPOL) as well as tank farm cleaning. Collection and delivery of slop oil are mainly carried out by Phoenix's own fleet of trucks.

The facility processes 10,000 m³ of waste oil annually (oil content 25–30 percent), equivalent to 3 m³ per hour—of which 2.25 m³ is water that requires treatment. The oil received contains high levels of water and solid impurities, which reduces processing efficiency and affects the quality of the recovered oil. Additionally, strict environmental limits for wastewater discharge are set by

the Finnish Environment Agency.

To meet these challenges, Phoenix implemented an optimized recovery and purification process. The company collects, processes, transports, and recycles oils in compliance with MARPOL and environmental standards. Alfa Laval decanters and centrifuges, together with Lucent's Emulsion Treatment 166, are used to separate water and contaminants from the oil. The plant is partly designed by parent company HEAD Engineering. The recovered oil is refined into REACH-classified fuel for industrial use, while the separated water is treated through centrifugal separation and carbon filtration before being safely discharged.

Outcome:

- **Collection & Recycling:** Oils are collected, treated, and recycled in line with MARPOL and environmental standards.
- **Separation:** Alfa Laval centrifuges and Lucent's demulsifier remove water and contaminants.
- **Oil Recovery:** Recovered oil is refined into REACH-classified industrial fuel.
- **Water Treatment:** Water is purified via centrifugation and carbon filtration before discharge.

Our Onboarding Procedure

– your Safety

When it comes to oil analysis and purification, we leave nothing to chance. Our onboarding process is designed to ensure the highest standards of quality, safety, and customer satisfaction in every step.



Expertise and facilities

Highly skilled chemical staff ensures:

- Initial analysis to ensure compatibility
- Knowledge in purification of a wide range of oils
- Chemicals of our own production

Expertise & Advanced Facilities

Our highly trained chemists operate in sophisticated laboratories. That guarantees precision and reliability in every step of the analysis. Our wholly owned production facilities ensure control over the process.

Attention to Detail & Customer Satisfaction

We meticulously examine every aspect of the process to deliver the best possible solution regarding quality and service.

Thorough Testing – Before & After

- Pre-analysis of clean oil establishes a reliable baseline.
- Sample analysis of slop oil provides a clear understanding of its condition.
- Final analysis of the slop oil and water phase ensure optimal performance and quality.

Lucent Chemicals AB

- Part of the HEAD Engineering Group

Lucent is a Swedish company specializing in the development, production, and supply of chemical products within two core business areas: Industrial Oils and Oil Recovery. Our expertise lies in delivering customized process solutions by combining surface chemistry with thermomechanical technologies. We formulate and manufacture our own chemicals to optimize processes and enhance conventional methods across various industries.

Industrial Oils: Lucent develops and produces advanced process solutions and surface-active products for the continuous cleaning and recirculation of process oils used in manufacturing industries. Our product portfolio includes oil purification, synthetic lubricants, and regeneration solutions for rolling mill oils and lubricating oils.

Oil Recovery: Our oil recovery division focuses on advanced methods and processes for separating and reclaiming oil from low-quality sources. This includes the recycling of slop oil sludge and bilge water from the shipping industry. Through our refining processes, we produce REACH-classified fuel oil, clean water, and minimal residual waste.



HEAD Engineering

Parent company Head Engineering, a leading mechanical design firm founded in 1982, brings a unique and powerful combination of chemical innovation and separation expertise. With decades of experience in mechanical engineering Head Engineering creates high-performance solutions that maximize efficiency, durability, and sustainability across industries. This synergy between chemistry and thermomechanics enables the group to develop superior solutions.

Phoenix Collector

Phoenix Collector in Finland is specializing in the collection and purification of slop oil from the shipping industry. Using HEAD Engineering's advanced centrifugal separation technology, combined with Lucent Chemicals' specialized formulations, Phoenix Collector ensures the efficient recovery and recycling of waste oils. By integrating cutting-edge mechanical processes and advanced chemistry, transform contaminated oils are transformed into high-quality, reusable fuel.





Address:

Lucent Chemicals AB
Box 1192
131 27 Nacka strand
Sweden

Visiting address:

Jakobdalsvägen 19
131 52 Nacka strand
Sweden
Tel: +46 8 22 60 60

Info@lucent.se
www@lucent.se