CentriCHEM

INNOVATION TO TREAT OILY SLUDGE, RECOVER OIL, MINIMISE WASTE, AND REDUCE DISPOSAL COSTS

With stringent legislation, growing disposal costs, and limited on-site storage space, Ondeo Industrial Solutions and Surface Active Solutions (SAS) have developed an innovative alternative to treating and managing oily sludge on refining and petrochemical sites. By combining a containerised heated centrifuge and a unique MicroEmulsion chemistry of a SAS MIST System, oily sludge can be reduced by up to 90%, disposal costs can be reduced typically by 50%, while oil and water can be recovered from the process. This can also increase storage capacity on site and reduce the need for expensive tank cleaning with associated high disposal costs.

SURFACE ACTIVE SOLUTIONS

suez environnement

Ondeo IS

CURRENT MARKET CONDITIONS

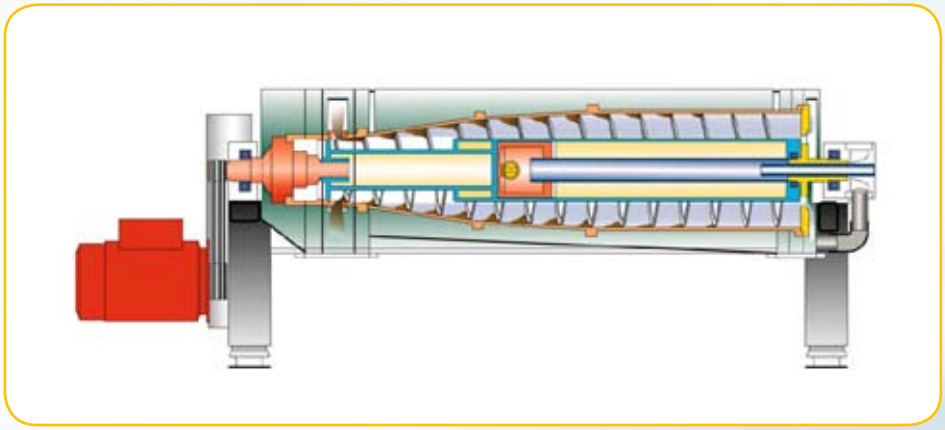
Every year, the refining and petrochemical industry produces a significant amount of sludge. In Europe alone this is estimated at around **656,000m³**, which comes from a range of sources such as crude oil storage tank bottoms and effluent treatment plants. Oily sludge can be troublesome to treat and as landfill taxes continue to rise, this can cause considerable **disposal costs** particularly if the sludge is classified as hazardous. Over the past 10 years, an increase in regulations (such as the Landfill Directive and Hazardous Waste Directive) has lead to fewer, more costly hazardous waste disposal routes.

Refineries increasingly have to **process lower quality crude** oil as world reserves decline, which produces byproducts that are more difficult to treat and dispose off.

It is, therefore, essential for refining and petrochemical companies to explore **alternative upstream treatment** methods that can manage and reduce oily sludge of varying characteristics.

INNOVATIVE OILY SLUDGE MANAGEMENT

Using an innovative new sludge treatment and separation technique **combining centrifugation and MircoEmulsion technology**, developed by Surface Active Solutions, we have developed a unique method to treat oily sludge. This can significantly **reduce oily sludge** by up to **90%**, **reduce disposal costs** typically by **50%**, **recover oil** that can be sent back to the refinery for reuse, and provide **environmental benefits**.



How does it work?

Oily sludge generally contains crude oil, water and solid particles in various proportions depending on its origin and the quality of the original crude oil. The oil element is made up of a wide variety of compounds that are classified into free oil, waxes and asphaltenes. It is the waxes and asphaltenes that, under normal circumstances, act as solid components and are not removed in conventional oil/solids separation techniques such as non-chemically enhanced centrifugation. By **breaking the oily sludge down into layers** with the use of SAS MircoEmulsions and a heated centrifuge each layer can be treated, reused or disposed off in a more effective and cost efficient manner. This includes recovering oil that can be sent back to the refinery to be processed, water that can be disposed of to the environment after further treatment through onsite waste water systems, and minimal levels of solid 'cake' being sent to landfill.

BEFORE Treatment

AFTER Treatment

Reference

This method is currently being successfully used to treat oily sludge at a large refinery based in the UK at a processing rate of **10m³ per hour**. In a short period, over 9,000 tonnes of sludge has been processed using this approach. Previously, oily sludge was mainly being tankered off site as existing technology did not produce effective results, particularly because of the difficulty in treating the inconsistent quality of oily sludge. Since introducing the energy and cost efficient process, the waste that has been processed has recovered up to **40% as oil** which is pumped back to the refinery for processing, up to **75% as water** has been recovered which is then treated at the effluent treatment plant for safe disposal back into the environment, and typically **10% as dry solids** has been recovered which is disposed of to landfill.

During testing, it was shown that the **right combination of chemistry** using the SAS MircoEmulsion and temperature was an integral part in the overall process to demulsify the oily sludge into its distinct phases. Here is a typical example of the four layers that is produced, but this varies depending on the original sludge quality:

Oil	**15%**
Rag Layer of ultrafine solids	**20%**
Grey Water	**55%**
Cake for disposal	**10%**

Safety First

The safety of our employees and those around us is paramount, therefore, we actively promote **safe behaviours** and practices, and have won many customer safety awards for doing so. This is especially important while working in hazardous areas on sites such as a refinery or petrochemical plant. Having operated and maintained water systems and installed many improvement projects in zoned areas for several years, we understand the procedures and processes that surround this. Our approach to safety has been considered since the start of this project which has lead to the process using the **only nitrogen purged, heated unit** in use on a UK refinery which fully **complies with zone and DSEAR/ATEX** requirements.

The patented SAS chemical technology used is also **non-hazardous**, is readily **biodegradable**, **non-toxic**, **non-flammable** and **non-corrosive**. The fully **REACH Registered** product is, therefore, classified as being best in class in relation to environmental performance. In addition, the chemistry uses unique SAS bio-based technology providing a fully sustainable solution.

Plus, the whole system can be fully mobilised within a **containerised format** providing clients with ultimate flexibility.

BENEFITS

- **Recover Oil**
- **Minimise disposal cost by up to 50%**
- **Reduce waste going to landfill**
- **Technical expertise**
- **Improve environmental compliance**
- **Increase storage tank capacity**
- **Packaged containerised unit**
- **Improve safety with full zone and DSEAR compliance**
- **Reduce transportation costs**
- **Operation and maintenance expertise**
- **Reduce environmental risk**
- **Less energy or capital intensive than alternative market solutions**

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