



Freeze-Tec

Using our ground-breaking methods and state-of-the-art technology, Studsvik's **Freeze-Tec** provides clients with an optimal solution to a multitude of waste management issues. We work closely with our customers to deliver an innovative, tailored product that offers significant benefits when handling, managing, and/or treating substances such as aquatic sediments and contaminants, sludge, and residues. Studsvik's **Freeze-Tec** offers our customers a range of benefits including:

- Improved environmental performance against conventional technologies to improve your environmental credentials
- Safe handling due to the immobilisation of the media allowing you to maintain a safe working environment
- Cost savings from reduced energy consumption, reduced volumes for transport and easier disposal of dryer materials

Products and Benefits

Studsvik's Freeze-Tec Dewatering, Dredging, and Sampling are the central processes and technologies of the **Freeze-Tec** line. The major benefits of each of these are highlight in the diagram below.



Freeze-Tec Dewatering

- Reduces Costs – lower energy consumption along with reduced transport and remediation costs due to greater volume reduction
- Reduces Environment Impact - lower energy consumption, reduced carbon footprint and potential reuse of processed waste as biofuel
- Enhanced Safety - no harmful chemicals used in the process



Freeze-Tec Dredging

- Reduces Costs – precision targeting of contaminated materials leads to reduced volumes removed for treatment and storage
- Reduces Environmental Impact – targeted removal mitigates impact on the surrounding area and ecosystem
- Enhanced Safety - stable state of the removed materials reduces the risk to personnel



Freeze-Tec Sampling

- Improved Sample Quality - process minimizes the risk of cross contamination
- Increased Sampling Accuracy and Precision - flexible sampling configurations allow for retrieval of accurate sample amounts at precise depths
- Enhanced Safety - sampling process tailored to comply with specified protocols for handling, transport, and storage of collected samples

Studsvik Freeze-Tec Customer Benefits

Freeze-Tec Dewatering

Is an advanced, effective and environmentally sustainable way of drying sludge. Through advanced freeze technology an optimized freeze-thaw cycle is created to remove bound water and transform the sludge into coarse particles with low water content.

- Capable of treating all known types of sludge
- Substantial volume reduction of sludge
- Low energy consumption
- Portable methods can be applied on-site
- Superior reduction of water content
- In some cases, processed sludge can be reclassified as soil or used as biofuel
- Increased variety of options for remediation, refining and recycling

Freeze-Tec Dredging

Is a safe, clean process for the removal of contaminated material. Contaminated sediments are stabilized, in-situ, and are safely removed in a frozen state. The material can then be examined, treated, and disposed of after thawing.

- Prevents the redistribution of contaminated material during the lifting process
- Allows targeted removal of contaminated materials
- Portable and flexible solution, can be tailored to size and shape required
- Offers a safe method for removing radioactive and combustible, unstable materials
- Limits direct human contact with contaminated materials

Freeze-Tec Sampling

Consists of a number of sampling techniques that allow for accurate sample recovery at precise depths and profiles within a sludge or sediment.

- Able to sample all known types of sludge
- Clean removal of the sample without the risk of cross contamination
- Offers three types of sample:
 - Surface sample, removing the top section of the sludge
 - Reversed core sample, removing a sample of the entire depth of the sediment to sample layers
 - Specific depth sample, removing a section from a specific depth
- Able to tailor the sample size to match sampling requirements
- Portable solution allowing it to be used in controlled environments using remote handling equipment

You can deal with your problematic waste streams...

...because of Studsvik's new state of the art Freeze-Tec processes

Previous Application Examples

Application	Contamination	Customer	Benefits/Results
Freeze Dredging	Mercury near sewage pipes	Akzo Nobel	No disturbance in the water. Reduced final waste volumes. No need for boundaries surrounding the treated area.
Freeze Dredging/ Dewatering	Radioactive sludge in fuel storage ponds	Bradwell Nuclear Power Station	Remote controlled operation for operator security. Final waste minimized.
Freeze Dredging	Sewage sludge in lake, 2000m ² Algae overgrowth	City of Storuman (Sweden)	Precision treatment to intended depth (5 cm). No need for silt or bubble curtains. No dispersion of contamination during operation.
Freeze Dredging/ Sampling/Dewatering	PAHs, TBTs, mercury and lead in 3500 m ² harbour area (10-120cm depth)	City of Stockholm	Sediment volume reduced and transported in sediment form. Continuous sampling for perfect result without any remaining contaminations.
Freeze Dewatering	Annual dewatering of 10,000 tonnes of oil decontaminated sludge	Ragn-Sells	20 times less energy consumed in drying/dewater production compared to a traditional belt dryer.

Studsvik

Thomas Vernersson - Specialist Waste Treatment
SE-611 82 Nyköping
Sweden
Phone: +46 (0) 155 22 15 15
Mobile: +46 (0) 760 02 15 15
E-mail: thomas.vernersson@studsvik.com

David Oxberry - Managing Director
Ribble House, Meanygate
Bamber Bridge, Preston
PR5 6UP
Phone: +44 (0) 1772 440160
Email: david.oxberry@studsvik.com

Bob Manseill - Engineering Business Manager
5605 Glenridge Drive
Suite 670
Atlanta, GA 30342
Phone: +1 678 748 6156

E-mail: bob.manseill@studsvik.com

