

Cooling Superheated Water Vital to Continuous Toxin Recovery System

Delta Cooling Towers, Inc.

The need continues to grow for the efficient remediation of soils and waters, and recovery of otherwise hazardous hydrocarbons – without venting harmful VOCs into the atmosphere.

Now an advanced technology is providing a solution for the remediation and recycling of soil, sludge, and other materials containing a wide range of organic contaminants such as oil sludge ponds, oilfield drill cuttings, tank bottoms dregs, and soils contaminated with a host of other hydrocarbons.

The technology — indirect thermal desorption – is a remediation process designed to separate the organic constituents from a waste stream. Useful materials, including hydrocarbons, are recovered in such a manner that they are preserved for collection and recycling.

“The concept is much different than the traditional approach — transporting the waste material to a hazardous waste landfill or an incineration facility where the valuable hydrocarbons invariably burned and released to the atmosphere in the form of greenhouse gases,” says Tony Dollins, Vice President at RLC Technologies, Richmond, Va.

“With our Thermal Desorption technology materials can be treated on site. Treatment is accomplished through indirect heating of the feed material in an anaerobic (oxygen-deficient) environment. The separation process not only allows the operator to recover the hydrocarbons in the waste, but also prevents the formation dioxins, furans or other toxic gases that would otherwise escape to the atmosphere. The remaining solid fraction (e.g. soil) is rendered non-hazardous and may be de-listed, allowing for disposal in a non-hazardous landfill. This avoids costly hazardous waste disposal fees and thereby saving our customers a lot of money.”

RLC Technologies manufactured its first Anaerobic Thermal Desorption Unit (ATDU) in 1997 when the company was founded by Dr. Robert L. Carroll, who currently serves as President and CEO.

Today, over thirty such ATDU systems have been installed in refineries, oilfields and waste processing facilities around the world, and are owned and operated by environmental and remediation services companies. The system’s effective hydrocarbon removal and recycling capabilities, its ease of regulatory emission permitting, and its greater acceptance by the general public have been key factors in its use among the refineries and the cleanup contractors throughout the world.

Handling the heat

Heat is an essential ingredient in the ATDU's process. Rather than burn the contaminated materials that are being treated, they are placed inside a drum and heated from the outside.

"The system elevates the temperature of the waste stream beyond the boiling point of the contaminants," Dollins explains. "The oxygen deficiency prevents the hydrocarbons from burning. So, instead of combusting they phase change into a gas and are extracted via vacuum from the rotary chamber. Vaporized hydrocarbons are delivered to the subsequent vapor recovery unit where they are cooled and condensed back into liquid form. In this process, the hydrocarbons are simply separated from the waste material, not oxidized or otherwise destroyed."

A water-cooled heat exchanger draws off the heat from the process driving the hydrocarbon gas condenser unit, facilitating recovery so that recovered hydrocarbons can be "bottled" for future use. Because this is a continuous system, the water must be reduced in temperature before it loops back through the system.

The vapor stream generated in the desorption unit is typically 4,000-5,000 CFM, Dollins explains. "By the time they come through the condensation system, the vapors are down to 200-400 CFM and the temperature drops from about 1,000 degrees (F) down to approximately 55 degrees. Ultimately, all of that heat has to be removed by the cooling towers.

"This makes the cooling towers an essential component of the ATDU plant," Dollins says. "Because the systems are designed to operate 24/7 for 15-20 years, we need to include in our system package cooling towers that are reliable and have a long service life."

For those reasons, companies that operate cooling systems in harsh environments often include HDPE (high-density polyethylene) plastic cooling towers. Manufactured by Delta Cooling Towers, Inc., located in Rockaway, N.J., these cooling towers are designed with a seamless shell that is impervious to water treatment chemicals and the harsh environments, either natural or industrial.

Uptime critical

According to Dollins, uptime is especially important for systems located in hot, humid environments or areas in close proximity to salt water which can be damaging to typical metal cooling towers. "With the loss of production dollars that any service or replacement downtime represents, we need the most reliable cooling towers available."

Cooling efficiency is also important to the volume of hydrocarbon recovery processing, and the HDPE cooling tower designs are able to maintain that efficiency.

The cooler the water, the more efficient the condensation process is going to be, and the more hydrocarbons are going to be able to condense and preserve for recycling.

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Delta models are easier to maintain than metal-clad systems. Not only are rust and corrosion problems non-existent, but direct-drive fan motors require far less maintenance than gear or belt-driven conventional towers, and are much easier to service when any maintenance is required. In many applications it is also significant that these motors consume substantially less energy.

In the past, plastic cooling towers were too small for many industrial and commercial facilities or required extensive field assembly. However, today that situation has changed. Delta has introduced a series of U.S. made factory-assembled plastic towers to suit almost any size requirements up to 2,000 cooling tons in a single, modularized unit.

The modularity of this system also makes the cooling tower scalable, a highly desirable feature for those who have smaller or intermediate cooling requirements today, but also want the convenience of easily expanding their cooling capacity as the business grows.

For more information, contact Delta Cooling Towers, Inc., 41 Pine Street, Rockaway, NJ 07866; Phone: 800-289.3358; Fax: 973.586.2243; E-mail: sales@deltacooling.com; [1] or visit the web site: www.deltacooling.com.

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