



MEGTEC

Solvent Recovery Adsorption and Distillation Systems

Proven solutions for EPA emissions control requirements



Solvent Recovery Using Carbon Adsorption Technology

- Recover up to 99%+ of all your solvents for re-use
- Remove volatile organic compounds (VOCs) or hazardous air pollutants (HAPs) from your manufactured process emissions to help meet or exceed regulatory requirements
- Increase profitability by reducing solvent expense

This is what a Dürr Megtec solvent recovery system will mean to you. These systems are based on today's most advanced and reliable adsorption and distillation technologies. They are site-specific and add long-term value to your manufacturing operation allowing you to produce high quality solvent-based products. These are clear competitive advantages found with Dürr Megtec solvent recovery systems.

Carbon Adsorption: The Natural Method of Solvent Recovery

Carbon adsorption is based on a natural phenomenon in which volatile organic compounds are adsorbed from an air (or other gas) stream in the microscopic pores of activated carbon and released when heated for recovery. Activated carbon is the most versatile of all adsorbents because of its broad pore size distribution and pore volume. Consequently, it is suitable for solvents with a wide range of boiling points and chemical structures such as alkanes, alcohols, esters and ketones, cyclic compounds and halogenated solvents.



Carbon adsorption system

Performance Benefits

- Proven solutions to address EPA emissions control requirements
- Recover solvents for reuse to reduce manufacturing costs
- Wide range of airflows and solvent loadings
- Suitable for wide variety of solvent types
- Very high emissions control and recovery efficiencies
- High turn-down ratio
- Materials of construction for minimal maintenance and extended equipment life
- Designed for ease of maintenance and operability

For Virtually any Process Generating Solvent-Laden Air

Carbon adsorption is the ideal VOC/HAP emissions control solution for manufacturing processes that utilize valuable solvents that when recovered, could be reused in the process, generating substantial savings over other emissions control methods where the solvents are destroyed.

Carbon adsorption is also ideal for VOC/HAP emissions systems from manufacturing processes that emit halogenated solvents which would be very costly to oxidize due to the by-products formed, the peripheral equipment required to treat them, and the associated capital costs.

Continuous and Automatic Processing of Solvent-Laden Air

A typical solvent recovery process consists of an activated carbon adsorption unit with two, but as many as seven, adsorber vessels and if required, an air stripper or distillation unit.

Solvent-laden air passes through a number of adsorber vessels in parallel, where the solvent vapors are adsorbed by specifically selected activated carbon. Once the carbon in an adsorber is saturated and solvent starts to slip, as detected by an optional gas analyzer, the solvent-laden air is routed to a standby adsorber and the saturated adsorber is regenerated.

Regeneration is accomplished by sending steam through a saturated adsorber, heating the carbon, and causing the adsorbed solvents to be released. The steam and solvent vapors that flow from the vessel are condensed into a liquid and cooled.

Water immiscible solvents are separated from the water in a decanter and collected for reuse. The water may be treated in an air stripper to remove small amounts of dissolved solvent before disposal or reuse to produce steam.

Solvents that are water miscible are separated from the water and purified in a distillation system.

Distillation, Purification and Recovery

Complete Systems for Separation and Purification

Water soluble solvents and multiple solvent mixtures may need to be separated from the water and/or separated into their individual components prior to reuse. Dürr Megtec offers complete extractive and azeotropic multicomponent distillation systems for the separation and purification of solvent mixtures.

Depending on customer and process requirements, these systems can be designed for either continuous or batch operations.

In applications where the decanted water phase contains solvent levels which cannot be sent directly to drain or existing water treatment facilities, Dürr Megtec provides a steam or air stripping column for solvent removal prior to discharge.

In steam stripping, steam is admitted to the base of the column. As the contaminated feed water flows downward, solvents concentrate in the top of the column and are removed overhead in a condenser. The product then may be sent to storage or returned to the decanter.

In an air stripping operation, air is passed through the column counter-current to the flow of liquid. Solvent transfers to the air stream, which may be returned to the inlet of the carbon adsorption unit, and purified water suitable for disposal is discharged.



Distillation system at pharmaceutical plant

Typical Process/Product Applications

- Chemical/petrochemical
- Pharmaceutical
- Semiconductor and electronics
- Membrane
- Soil vapor extraction and ground water remediation
- Degreasing
- Foam
- Rubber-coated fabrics
- Paper, film and foil coating
- Publication and packaging gravure printing

Design Features

Meeting your Exact Requirements and Space Constraints

Dürr Megtec solvent recovery systems are available in a wide range of flows and configurations to meet your system requirements and space constraints. Custom-designed units handle flows from 500 cubic feet per minute (CFM) to 1,000,000 CFM.

Turnkey, Pre-assembled Skid-Mounted or Field-Erected Large Systems

Dürr Megtec designs and builds completely pre-assembled skid-mounted systems for installation in sizes up to 20,000 CFM. We can also design, build, install, and commission larger systems on a total turnkey basis.

We have considerable experience in the design and installation of solvent-laden air collection duct systems, as well as the supply and installation of solvent storage tank farms and

utility generation equipment, such as boilers, cooling water systems, etc.

Flexible Controls and Instrumentation to Meet your Most Stringent Specifications and Standards

Dürr Megtec's control systems are designed, built and debugged entirely in-house. Programmable logic controllers (PLC), operator interface software packages and other key components are selected on the basis of performance, cost, operator familiarity and compatibility with systems currently at your facility.

A variety of local/remote instrumentation/controls for monitoring temperatures, pressures, tank/column levels, utility flow rates and other process parameters are also supplied. Dürr Megtec can assist in troubleshooting via remote system monitoring.

Materials of Construction that Meet your Exact Requirements

Dürr Megtec fabricates its adsorption and distillation systems with materials of construction selected to meet your specific requirements. Options include carbon steel, stainless steel (304, 316, 2205, AL6XN), Hastelloy®, titanium and other commercially available alloys.

Non-Regenerable Carbon Adsorbers

Dürr Megtec offers a range of non-regenerable carbon adsorbers suitable for treating low mass emissions of a wide range

of pollutants, from VOC/HAPs/solvents to odors and hydrogen sulfide. Once the carbon is saturated with the contaminant, the carbon is replaced with new carbon.

Non-regenerable carbon adsorbers can provide a low capital cost solution in applications where the total annual emissions is less than 10 tons. They can be provided as simple stand-alone units or as skid-mounted packages to minimize installation and commissioning time.

Typical Applications

- Process vents from reactors/columns/vacuum pumps
- Intermittent emissions from dryers and other processes
- Low concentration emissions from solvent processes including printing, painting and coating
- Odors from food and other organic processes
- To provide a back-up facility for another type of abatement, for example, annual maintenance

Design Features and Performance Advantages

- Optimized flow distribution through the carbon bed to minimize carbon consumption
- Minimize installation and commissioning time
- Handle a large range of VOCs and other pollutants with a single unit
- Facilitate easy carbon change out to minimize carbon handling
- Easy access for servicing

Dürr Systems, Inc.

830 Prosper Street
De Pere, Wisconsin, 54115 USA
Phone: +1 920.336.5715

www.durr-megtec.com

Subject to change. The information in this brochure contains only general descriptions or performance characteristics which may vary in actual cases. The requested performance parameters shall be binding only if they are explicitly agreed to within the sales contract. © Dürr 2020

Hastelloy is a registered trademark of Haynes International, Inc.

© Dürr 2020. All rights reserved.



For more information or to contact us, visit our website at www.durr-megtec.com