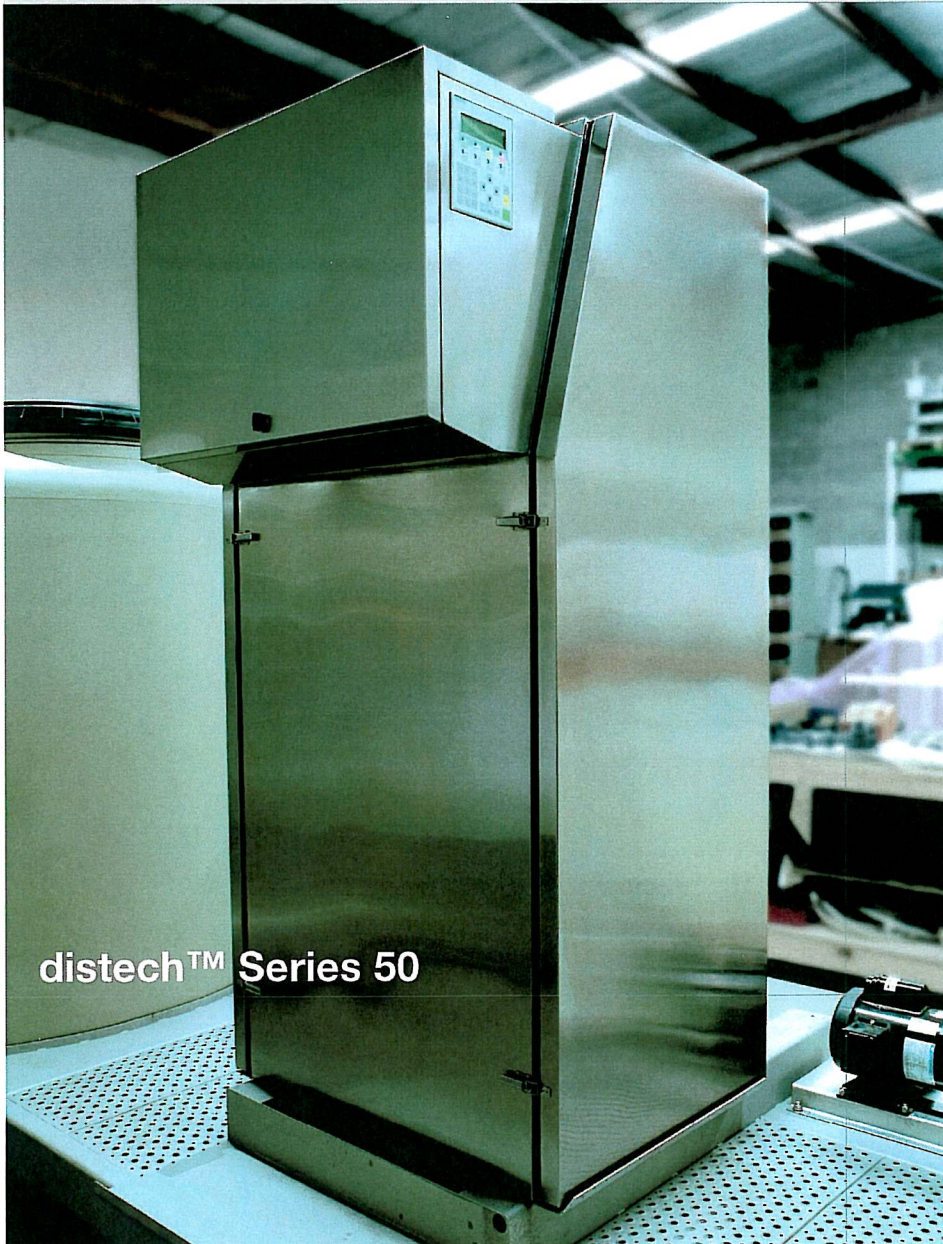


The Next Generation in Liquid Evaporation



Evaporation is the simplest and most effective long-term approach to reducing wastewater discharge volumes and eliminating sewer discharge problems altogether. Evaporation can be used either as a primary treatment for the total wastewater volume, or as a secondary treatment following a separation process. Evaporation offers a high degree of flexibility and versatility. An existing installation may be readily adaptable for presently unknown future applications.



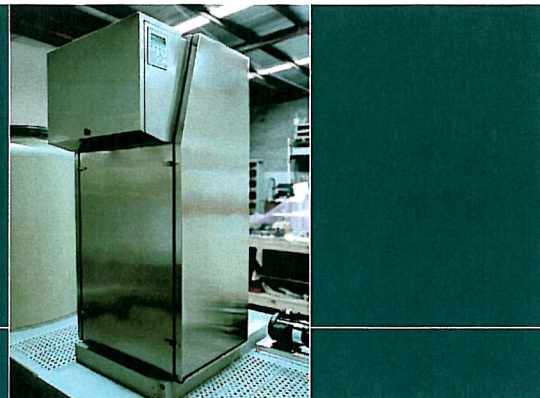
distech™ Series 50



Distech

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The Next Generation in Liquid Evaporation



Vacuum Evaporation

Vacuum evaporators distill water from process solutions at reduced temperatures compared with atmospheric evaporation. Several types of vacuum evaporators are used in the surface finishing industry: rising film, flash type and submerged. Generally, each consists of a boiling chamber under a vacuum, a liquid/vapour separator and a condensing system.

Energy for evaporation can be supplied either thermally or mechanically. Two techniques have been applied successfully to reduce the steam or electricity demand for evaporation, multi-effect evaporation and mechanical vapour recompression. Both involve reusing the latent heat.

Multi-effect evaporators are vacuum evaporators in series with different boiling points, operated at different vacuum levels. MVR evaporators are similar to single effect units, except that the vapour released from the boiling solution is compressed in a mechanical or thermal compressor. This compressed water vapour condenses, yielding latent heat of vaporization, which is used to evaporate more water from the concentrated liquid. MVR are the most energy efficient process available.

Reference: EPA/625/R-99/008 Capsule Report Nov 2000, 'Approaching Zero Discharge in Surface Finishing'

Distech™ Vacuum Evaporators

The Distech system is a Vacuum MVR evaporator, but represents a major advancement in the technology by combining vacuum and MVR in a single

Some advantages of evaporation

- Disposes as it separates in one step
- Eliminates sewer connection, discharge accountability and regulation uncertainties
- Can handle multiple waste streams and varying chemistries simultaneously
- Requires only moderate capital investment
- Can be installed as a stand-alone or complement to separation technologies
- Is simple to install, operate and maintain
- Keeps wastewater disposal in-house under management's control
- Accommodates future production/disposal changes with minimal impact
- Eliminates environmental considerations as limitations of production decisions

Advantages of Distech™

Evaporators in Metal Finishing Applications

- World's most energy efficient evaporator
- Saves thousands of dollars in annual operating costs compared to conventional evaporators
- Recovers pure distilled (DI) water for return to process
- Requires no external heating sources i.e steam
- Fully automated including PLC controls
- Recovers DI water without the need for a separate condenser and cooling tower
- Allows "closed-loop" - eliminates discharge to sewer
- No atmospheric discharge
- Small footprint - a fraction the size of conventional evaporators

	Distech	Gas Fired Evaporator (incl Condenser)	Electric Powered Evaporator
Evaporation rate (GPD, 24 hours)	1,500	1,500	1,500
Power source	Electric	Gas/electric	Electric
Energy per Gallon	341 BTU's	9000 BTU's	9000 BTU's
Heating power req.	120 kwh	180 therms	3,400 kwh
Fans/pumps	Incl.	90 kwh	90 kwh
Power cost/day	\$18	\$115	\$524
Maintenance \$/day	\$10	\$5	\$5
Operating cost/day	\$28	\$145	\$529
Cost per gallon	\$0.0187	\$0.0963	\$0.44
Annual op cost (300 days)	\$8,400	\$43,500	\$158,700
DI water recovered	Standard	Yes	Yes
Footprint	< 10 sq. ft	30-50 sq. ft	30-50 sq. ft

Notes 1. Electric cost = \$.15/kwh

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