

FIGHT POLLUTION THROUGH WASTE PREVENTION

US EPA RECORDS CENTER REGION 5



466609



Luwa

Solvent Recovery Systems

Luwa Solvent Recovery Systems

For continuous recovery of solvents from waste streams.

Luwa thin-film solvent recovery systems fight pollution through waste prevention... and put a profitable squeeze on waste streams.

Now, with one compact system you can avoid the high

labor costs and limited production of batch still recovery, and get better yield, too.

Luwa systems recover 90 to 98% of the solvent with continuous, single-pass

operation. At high throughput rates they easily handle viscous bottoms streams to 35,000 cp or higher. And each system comes complete, ready for fast connection to waste storage tanks and utilities.

What's in the Luwa System

The principal component of a Luwa solvent recovery system is a thin-film evaporator (see illustration, right).

It is this Luwa developed evaporator which permits the system to operate at high efficiencies and high throughput rates without fouling. Other basic components in the system are:

- External separator
- Product condenser
- Feed, residue and product pumps
- Vacuum system
- Controls and instrumentation

In addition, Luwa can also provide automatic controls, solvent fractionating columns and many custom features depending on process requirements.

How the Luwa System operates

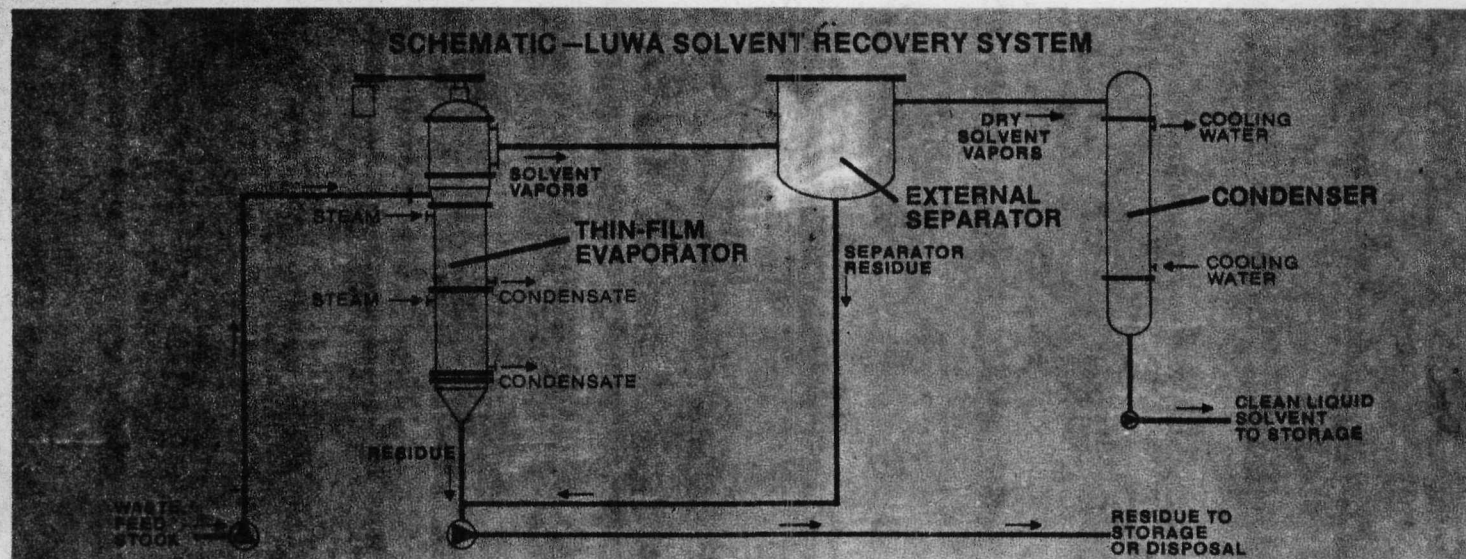
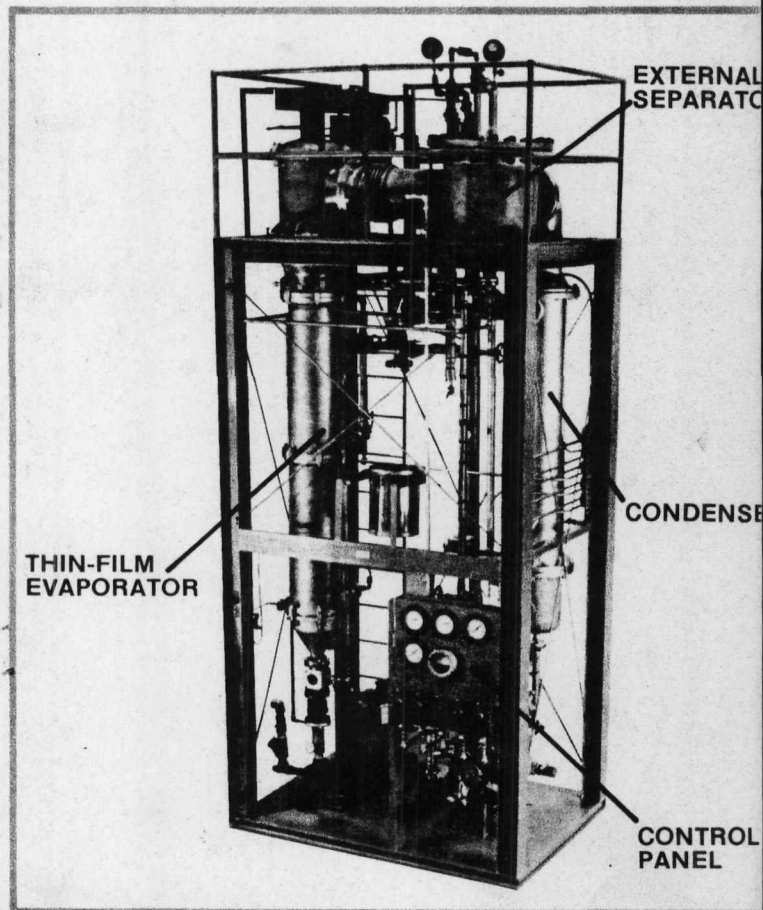
Waste feed stock is pumped from storage into the thin-film evaporator, as shown in the schematic below.

Close-clearance, rotating blades in the evaporator spread the feed evenly over the thermal walls. The time that the material is in the evaporator is controlled by a special residence-time control device called an RT Control Ring. Solvent evaporation occurs rapidly, usually in seconds.

Solvent vapors leave the evaporator and pass into a separator which permits only dry vapors to pass into the condenser.

Clean liquid solvent formed in the condenser is then pumped to storage.

The residue is pumped to disposal (incineration or other means) or to initial storage for recycling.



Major features of the Luwa System

The high efficiency of the Luwa system is due primarily to the effectiveness of the Luwa thin-film evaporator in achieving high heat transfer and high solvent recovery, without surface fouling.

Because there is little or no surface fouling—a problem inherent with many conventional recovery systems—cleaning costs

and downtime for the Luwa system are negligible.

All components in the system are self-draining. The material for each component has been specially selected for its corrosion resistance and serviceability. The evaporator, for example, is constructed of 316L stainless steel. This heavy duty construction gives

the system the versatility to meet the requirements of a broad range of applications. Typical applications are listed below.

And Luwa assumes single-source responsibility for the entire system, including start-up. For capacities to 400 gpm, Luwa can also supply a fully assembled, skid-mounted package, ready for operation.

Approximate space requirements

The chart below and the illustration at right may be used to determine the approximate space required by one of the five standard Luwa solvent recovery systems.

| System | A (ft) | B (ft) | C (ft) |
|--------|--------|--------|--------|
| L-150 | 12 | 6 | 5 |
| L-210 | 15 | 7 | 5 |
| L-300 | 17 | 8 | 6 |
| L-430 | 20 | 10 | 8 |
| L-600 | 25 | 12 | 10 |

APPLICATIONS

Cleaning Solvent

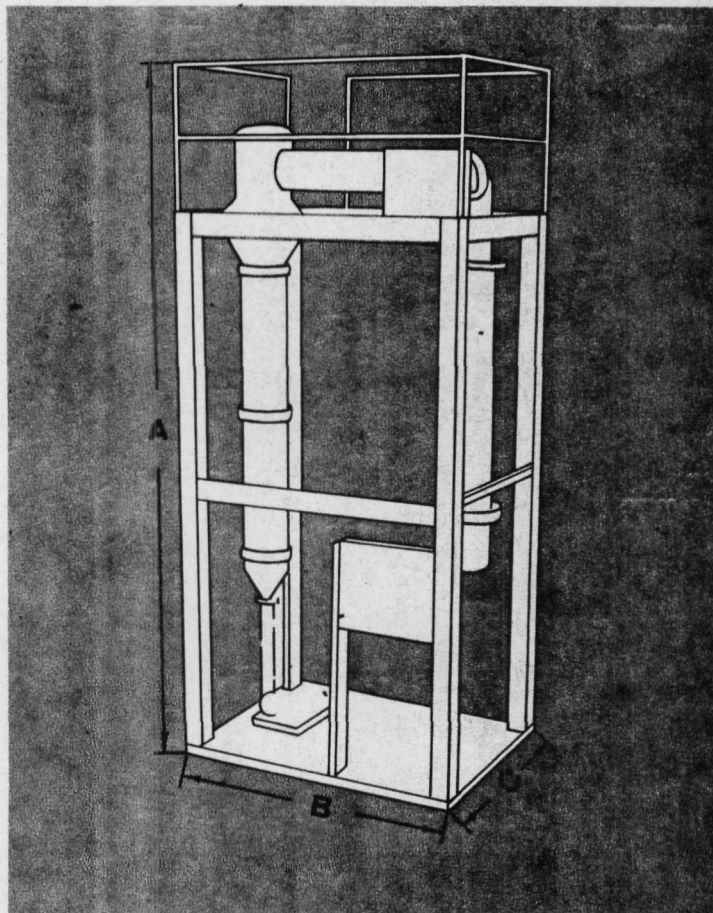
- Paint Lines
- Paint, Varnish, Resin Manufacturing
- Reactors, Towers, Tanks
- Machinery

Process

- Tail Streams
- Monomer Recovery
- Process Solvents
- High Vacuum, High Temperature Distillation

PRODUCTS

| | |
|--------------------|-----------------------|
| Toluene | Perchloroethylene |
| Xylene | Trichloroethylene |
| Styrene | 1,1,1-Trichloroethane |
| Ethyl acetate | Hexane |
| Isobutyl acetate | Fatty Acids |
| Methylethyl ketone | Water |
| Acetone | Tetrahydrofuran |
| Propanol | |
| Isopropanol | |
| Complex organics | |
| Butanol | |
| Hexanol | |
| Heptanol | |



Performance data

System size designated by Luwa evaporator size

| System Size | Distillation Surface (sq ft) | Nominal Recovery (gph) | Nominal Steam Consumption (lb/hr) | Cooling Water Requirement (gpm) | Electrical Requirement (hp) |
|-------------|------------------------------|------------------------|-----------------------------------|---------------------------------|-----------------------------|
| L-150* | 5.4 | 100 | 180 | 25 | 5 |
| L-210* | 10.8 | 200 | 360 | 50 | 7 |
| L-300* | 21.6 | 400 | 720 | 100 | 11 |
| L-430 | 43.2 | 800 | 1440 | 200 | 16 |
| L-600 | 86.5 | 1600 | 2880 | 400 | 23 |

*Entire system may be skid mounted

About Luwa

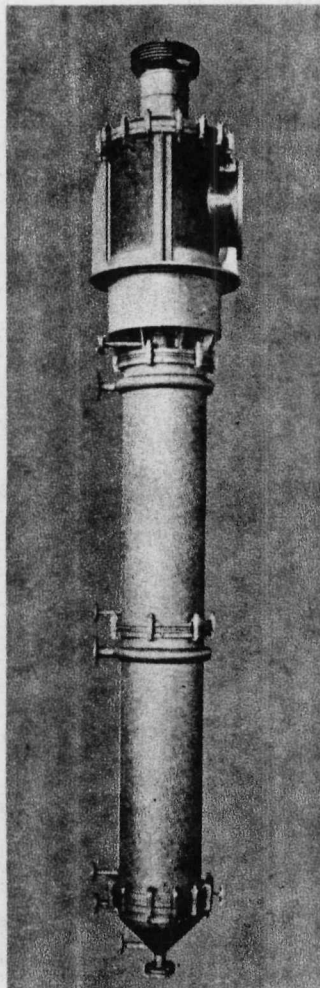
A worldwide company, Luwa is the recognized leader in the development and manufacture of thin-film processing equipment.

This leadership is backed by a generation of solid experience in all phases of thin-film processing for the chemical, pharmaceutical and food processing industries. In fact, Luwa pioneered thin-film processing.

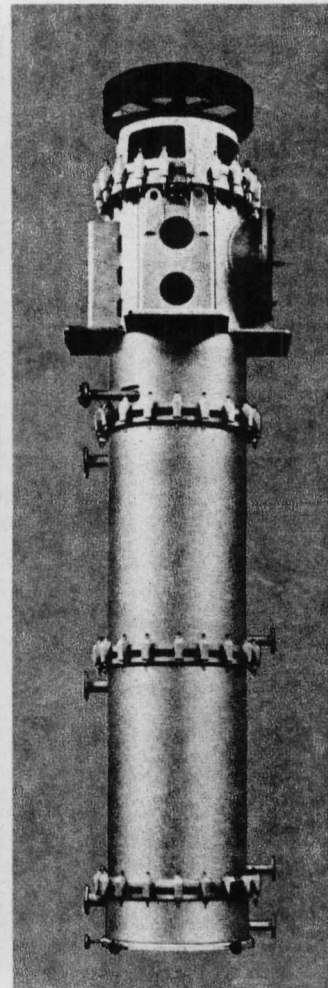
From concept to production, Luwa provides valuable, in-depth service each step of the way. For example, Luwa specializes in complete thin-film systems engineered around Luwa thin-film equipment. We supply all components, instrumentation, flow sheets and layouts. Even start-ups. Naturally, you're assured of total system performance.

For products with unknown behaviors or critical sensitivities, Luwa's extensive pilot facilities are available for thorough testing on a broad range of parameters. From our pilot runs, either long or short, you receive complete data for accurate evaluation of production and operating needs scaled to your operation.

Most important, there's a Luwa field engineer ready to answer your specific questions about thin-film processing, right now. He's a well-trained specialist who can start you in the right direction. And stay with you until the job is done.



Luwa Evaporator—for discharge of viscous liquids and residues

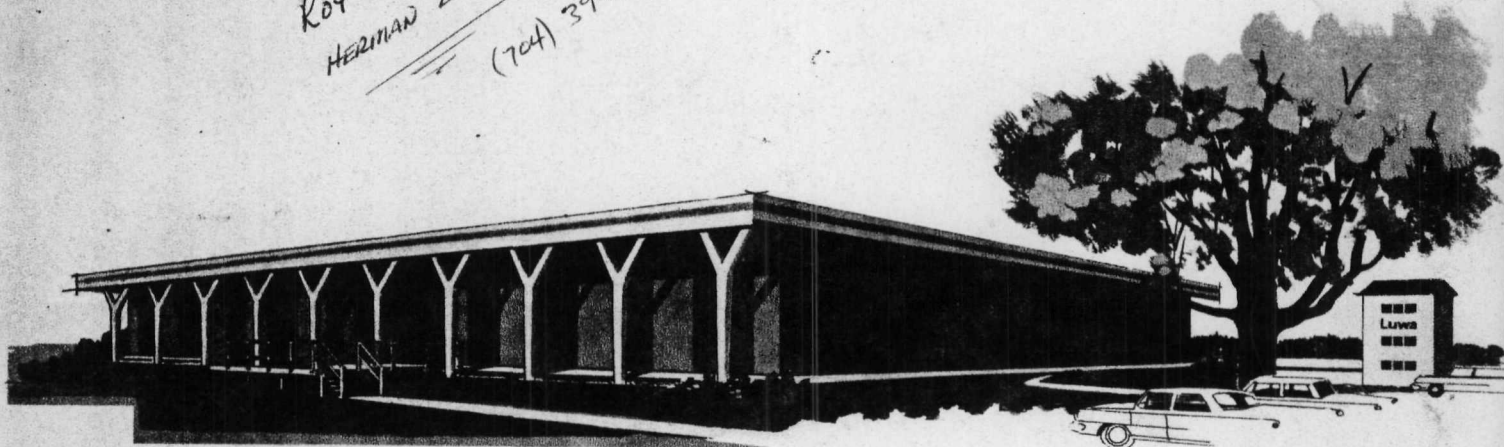


Luwa Dryer—for discharge of free-flowing powder



Luwa Pilot Plant Test Facilities, Charlotte, N.C.

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