POPE 12" WIPED-FILM MOLECULAR STILL

OFFERS BIG ADVANTAGES IN SEPARATIONS OF HEAT SENSITIVE MATERIALS

- Lowest degradation and highest yield—exposure to vacuum lowered temperature is brief (seconds).
- Increased capacity ideal for large pilot plants—and small to moderate scale production plants.
- Joins standard still line with 10.5 sq. ft. of evaporative surface and feed rates up to 55 gallons/hour.

New Pope Molecular Wiped-Film Still System includes vapor trap, rotary vane and diffusion pumps, feed and discharge gear pumps, optional feed vessel with mixer, optional residue cooler, and optional control panel. (2" glass molecular lab still shown between discharge pumps for size comparison.)

With this versatile 12" diameter Wiped-Film Still, Pope has greatly increased the range of applications for which this gentle thermal separation process is ideally suited. With 10.5 sq. ft. heated surface area, this larger capacity unit offers processing feed rates up to 500 lb/hr, or roughly 27 drums per day.

All Pope Wiped-Film Stills separate volatile from less volatile components with a gentle process utilizing the thin-film wiping action of feed liquid through a heated cylindrical vacuum chamber. The result is an efficient thermal separation technique with minimum product decomposition and maximum product quality.

The Pope Wiped-Film Still has proven superior to conventional column stills, falling film stills, rotary evaporators, and other separation equipment. Pope design features optimize the important performance advantages inherent with this technique. The brief (seconds) exposure of feed liquid to heated walls is due in part to the slotted wiper design which forces the liquid downward with strict control of residence time, film thickness, and flow characteristics. (This avoids the lack of control and contaminating liquid "flinging" inherent in roller-type systems.) Helping produce high vacuum capability are high quality components like the mechanical rotary seal, state-of-the-art fittings and materials, and total quality control during all phases of fabrication.

In addition to its superior processing efficiency, extra production capacity, and increased versatility, the new 12" Pope Wiped-Film Still offers limitless scale-up potential. This is a continuous (not batch) process with operational characteristics identical throughout the size range of equipment.

Keys to the superiority of this high vacuum process include short residence time of the feed liquid, a significantly lowered temperature due to high vacuum capability, and optimal efficiency in mixing, and mass and heat transfer.

pope SCIENTIFIC INC

POPE 12" WIPED-FILM MOLECULAR STILL DELIVERS HIGH QUALITY PRODUCT

UNEXCELLED FOR MOLECULAR DISTILLATION, CONCENTRATION, EVAPORATION, AND STRIPPING

PROVEN IN WIDE RANGE OF APPLICATIONS — FROM BENCH-TOP OR PILOT MODELS TO COMPLEX MULTI-STAGE PRODUCTION SYSTEMS

Adaptable To Many Processing Requirements.

Although all Pope Wiped-Film Stills utilize the proven thin wiped-film process, the overall design can vary greatly between systems. Pope turnkey plants generally are multistage and include molecular still(s), degassers or pre-evaporator units, vacuum pumps, feed and discharge pumps, vapor traps, instrumentation, plus other equipment essential to the system. A typical variation reconfigures the molecular still with internal condenser to a wiped-film evaporator (WFE) with external condenser for high percentage solvent removal. Another option substitutes a packed column still for the external condenser, providing continuous multi-plate fractionation for heat sensitive materials.

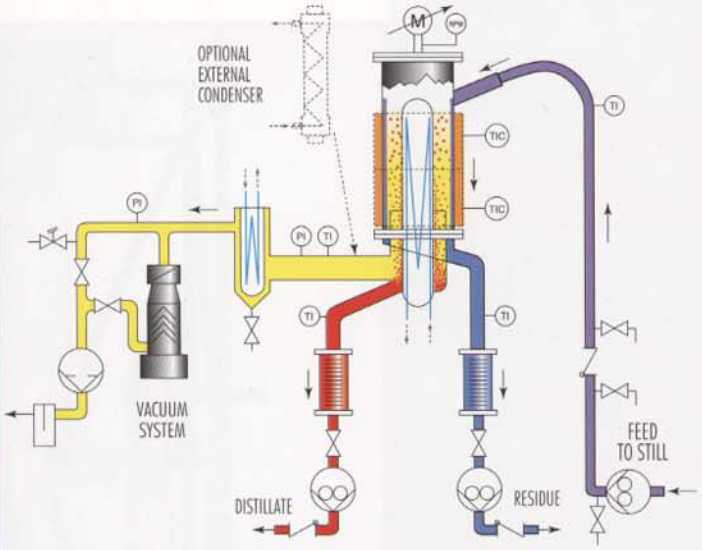
Proven In Many Applications Worldwide.

- Pharmaceutical, Biomaterial Concentration
- Polymer Devolatilization
- Molecular Distillations Of Esters, Fatty Acids, Mono, Di, Triglycerides
- Residue Removal/ Decolorization
- Vitamin, Essential Oil Isolation
- Wax Fractionation
- Oil Deodorization
- PCB, Insecticide Removal
- Water Removal - ppm Level
- Food, Flavor Purification
- Solvent Recovery

A sampling of Pope Wiped-Film Still customers includes: ADM, Air Products, BASF, Ciba Geigy, Conoco, Dow, Du Pont, Glaxo, Merck, 3M, Nabisco, P&G, Union Carbide. Extensive global customer list is available on request.

Applications Assistance Addresses Your Needs.

Whatever your requirements might be, the engineering professionals at Pope Scientific can design the Wiped-Film Still system best suited for optimum results. Feasibility studies can be performed before the system is specified and a complete estimate of costs is provided.



Basic process shown in schematic. Feed liquid is admitted into still under vacuum, immediately spread into a very thin film and forced quickly down the evaporation surface. Heated walls (orange) and high vacuum (yellow) drive the more volatile components (distillate) to the closely positioned internal condenser as the less volatile components (residue) continue down the cylinder. The resulting fractions, thus separated, exit through individual discharge outlets.

Depending on application, the desired product is either the distillate or the residue fraction. Condensable low MW compounds collect in cold trap upstream of vacuum system. For high solvent loads, an optional external condenser may be installed immediately downstream of still. (With external condenser incorporated, the internal condenser may be removed to provide a typical "WFE" or Wiped-Film Evaporator configuration.)

Basic 2" molecular glass lab still. No. 40450-01. With optional external condenser, additional receivers, electric heater.

Turnkey two-stage molecular distillation processing plant. Includes degasser/devolatilizer (1st stage), 12" molecular still (2nd stage), liquid and vacuum pumps, multiple cold traps, heat recovery exchangers, complete control system (interfaceable to computer), support frame, and other system components. This system is capable of continuous operation to 1 millitorr, 375°C, and up to 200 kg/hr feed rate.

SPECIFICATIONS: 12" WIPED-FILM MOLECULAR STILL

Critical Dimensions	
ID:	12"
Heated Surface Area:	10.5 ft² (1m²)
Internal Condenser Surface Area:	27 ft² (2.5m²)
Typical Feed Rates	
High Molecular Weight Distillation:	30-200 lb/hr (14-90 kg/hr)
Low Molecular Weight Distillation (or Evaporation):	50-500 lb/hr (23-230 kg/hr) or greater
Vacuum Range	Ambient to better than 1 x 10^{-3} torr
Temperature Range	
Electric:	30-400°C
Hot Oil:	Limited by recirculating heater and oil specifications - normally 30-350°C
Steam:	Limited by standard jacket design of 80 psig maximum (equivalent to 163°C)
Materials Of Construction	
Drive:	316L ss (Hastelloy, others available)
Body, Internal Condenser:	316L ss (glass, Hastelloy, others available)
Elastomers:	Viton (Kalrez, others available)
Wipers:	Glass-filled Teflon (virgin Teflon, carbon optional)
Miscellaneous	
Rotary Seal:	Crane type 8 single mechanical, oil lubricated
Finish Of Wiped Surface:	16 microinch ("pharmaceutical grade")
Motor:	Variable speed DC TENV (explosion-proof optional), 1 1/2 hp., 240 VAC, speed controller included.

Other components such as liquid and vacuum pumps, instrumentation, vessels, heat tracing, recirculators, traps, etc., are specified to application requirements.

Basic System Dimensions	6 ft. x 6 ft. x 14 ft. high (180 x 180 x 430 cm) Footprint may be larger for particular applications. Height stated for maintenance clearance.
Utilities	
Electrical:	
Drive Motor:	240 VAC, sp 50/60 Hz, 10A
Electric Heating:	240 VAC, 3 ph 50/60 Hz, 36 kw
Other Components:	Depends on application. Turnkey plants have single power connection.
Cooling:	Tap water and drain, 5 gpm or less, application dependent. Optional recirculators available.
Exhaust:	Vacuum pump discharge exhaust, 200 CFM recommended.
Other:	Varies with application.

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