

PROTEIN RECYCLING

Systems
and
Equipment



75
Years of Trust

The Dupps Difference

- Experience
- Technology
- Quality

Continuous Rendering System Schematic	3
Material Handling/ Size Reduction	4
Cookers/Dryers	6
Evaporator Systems	8
Screw Presses	12
Process Controls	14
Service	15

With over seventy five years experience,

The Dupps Company offers the protein recycling industry the world's most complete line of systems and machinery — as well as unsurpassed expertise in creating better ways to recycle protein by-products into profitable meals and fats. We are proud of the technology we have pioneered and the services we can provide.

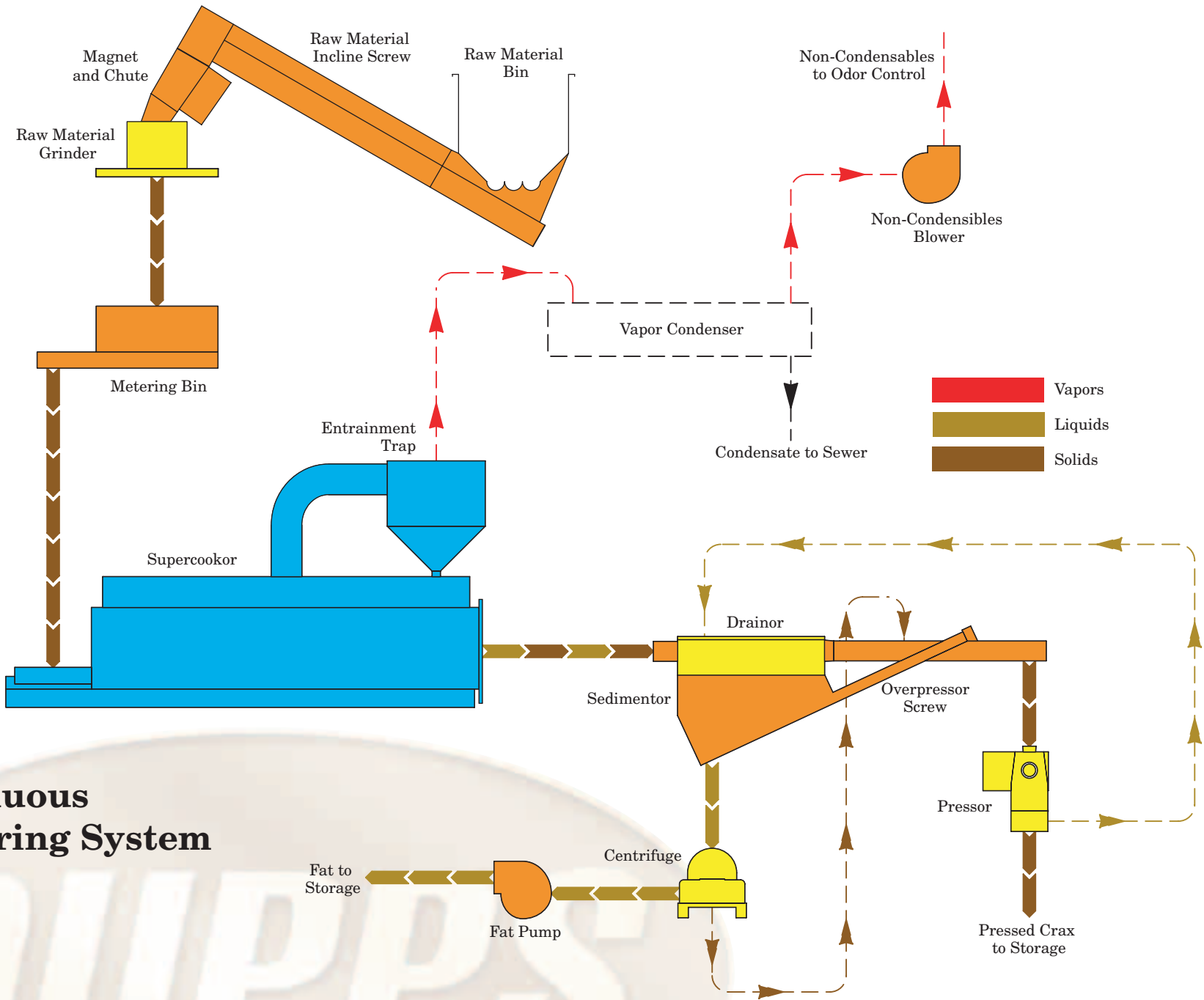
The Dupps product line includes all the equipment in this brochure. That's only part of the story, however, because we can also custom design, manufacture and install turnkey systems for your individual application.

Dupps product development, engineering and manufacturing skills translate your specific needs into specific solutions, whether you need one piece of equipment, an integrated system, a complete turnkey processing facility, or a retrofitted upgrade to your existing equipment.

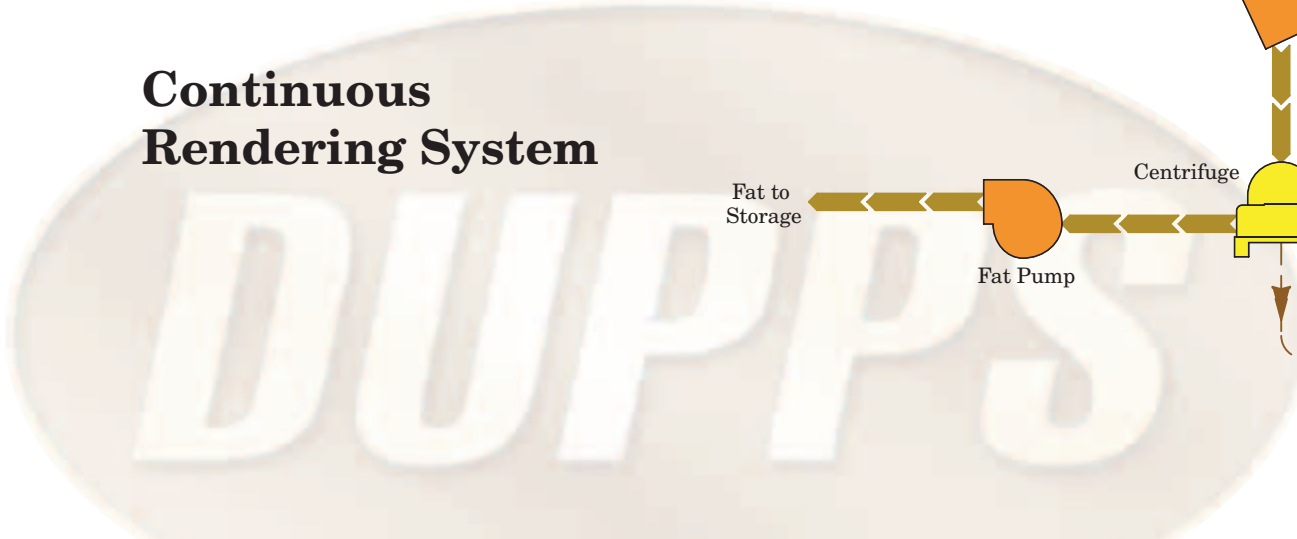
Manufacturing operations in our modern plant include machining, fabrication, assembly and testing capabilities. Our facility has long been ASME code-qualified for unfired pressure vessels. Along with the largest and most experienced rendering system service and support team in the industry, we maintain the industry's best inventory of maintenance and repair parts to help insure fast, dependable service and slash your downtime to the minimum.

Compare our capabilities, our products and our level of knowledge and experience to our competitors. When you know all the facts, we're sure you'll agree that Dupps is your logical choice. Because, when everything else is said and done, Dupps won't let you down.





Continuous Rendering System



Material Handling and Size Reduction

Screw Conveyors and Bins

Custom designed for your specific application in a wide range of material gauges, this equipment (top right) features a heavy duty drive system designed to withstand the stresses of rendering operations. You'll also get heavy duty bearings and drive shafts, plus gear guards designed for easy access, maximum protection and safety.

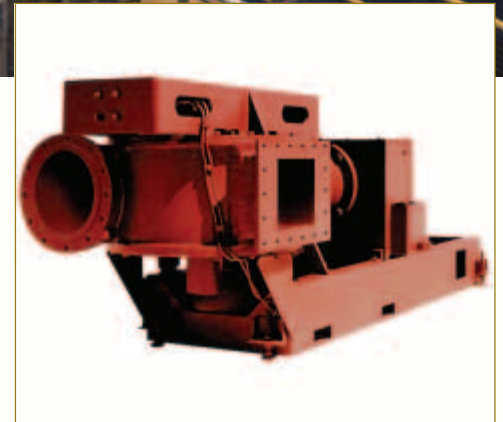
The Dupps Pump

The rugged Dupps Pump (middle right) moves any substance that can fit into a pipeline. It handles hot or cold raw material or finished product with no chance of product contamination. It pumps bulky solids as easily as slurries. And it performs either simple transfer pumping or metering to replace less efficient, more costly material handling methods.

Unlike any other pump, the Dupps Pump's hydraulically powered valve spade prevents material from backing up. Its easy-to-clear full-flow valve opens and closes with each piston cycle, and the hardened spade has enough power to crush or shear most common materials. Common applications include: transporting raw material, replacing conveyors, bucket elevators and other pumps, pumping whole poultry offal, metered feeding to a cooker, and metered discharging from a cooker. Dupps application experts can tailor a Dupps Pump to fit your operations precisely — pipelines can be routed along and through walls, even on the ceiling or outside the building. Inedible materials can be pumped through edible processing areas.

The Dupps "Lamella" Pump

Using impeller vanes rotating in an eccentric "cam" motion to move viscous raw material, the Dupps "Lamella" Pump (bottom right) offers high pumping capacity of up to 2,000 cubic feet per hour. Its compact size and multiple configuration options make it easy to adapt to both new and existing systems, while easy maintenance provides simple, fast access to all wear components. Its variable frequency electric motor features precise flow rate control and an auto-reverse feature to help clear any blockages.





Precrusher™

If you're looking for extremely low maintenance, the Dupps Precrusher pre-breaker (left) accepts large pieces without preliminary cut-up. Hardened machined teeth force material through its rugged anvils with low-speed shearing action instead of an impact or tearing action, and advanced controls help prevent and clear jams. The energy-saving Precrusher can break up to a ton of material per horsepower per hour. Low motor speed makes the unit less vulnerable to metal damage while providing high rotor torque to handle a broad range of materials.

Prehogor™

Here's a low cost answer to breaking up hard materials during primary size reduction. The Prehogor (top right) features welded, hard-surfaced rotor teeth and two anvil assemblies to break materials into approximately 1" to 2" pieces. The first anvil assembly provides the initial breaking action, the second assures uniform sizing.

Hogor™

You can feed 20,000 to 60,000 pounds of material per hour through the Hogor's large feed opening. It can handle both soft and hard materials, providing the smallest most uniform particle sizes averaging 1/2". Optional 2", 3" or 4" diameter screens cut long, stringy material.

Grindor™

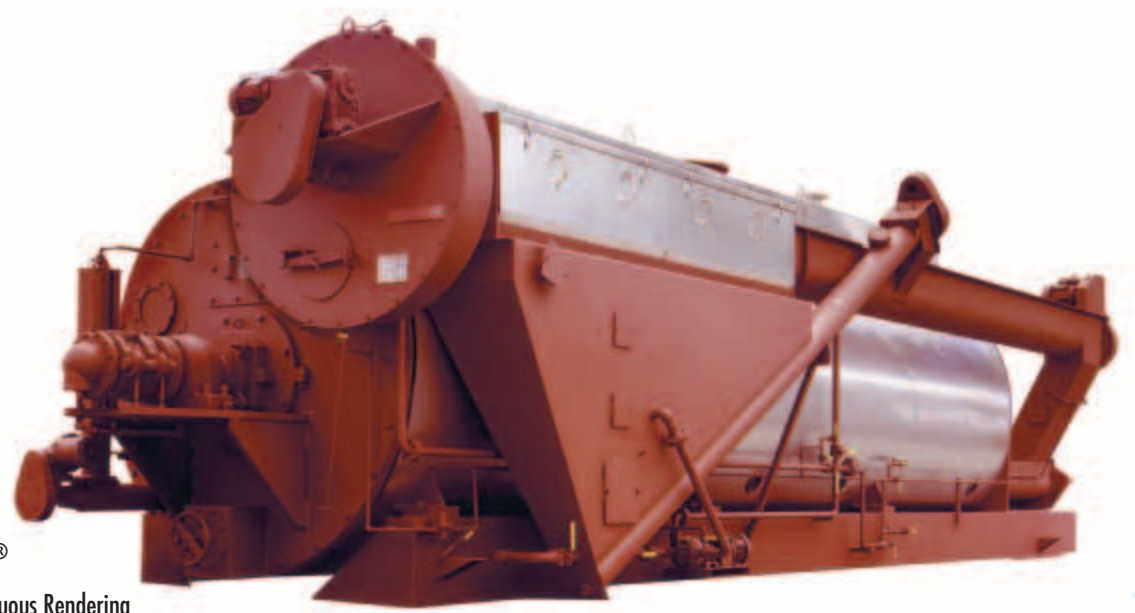
The high speed, high capacity attrition-type Dupps Grindor (middle right) features a side entry housing for less windage. You can reduce dry material to small, uniform pieces at an average rate of 100 pounds or more per horsepower, per hour and moist material at 60 pounds per horsepower per hour.

Titus II™ Hammermill

The new Dupps Titus II Hammermill (bottom right) features centrifugal "hammers" that swing out from divider plates mounted on a rotating shaft to impact material. These free-swinging, flared hammers are much more forgiving when foreign objects or unexpectedly hard material enters the crushing/grinding zone. Other important advantages of the Titus II include high material throughput and low maintenance thanks to no-bolt screens, easy-access components and a 1,750 rpm standard motor that maintains high output with less wear-and-tear.



Cookers and Dryers



Supercookor®

The heart of the Dupps Continuous Rendering System, the Supercookor (above) mixes raw materials while it heats them to produce a highly uniform product. End-point temperature and operating level are easy to control. With its steam-heated shaft construction that exceeds ASME Code, this is the most durable and efficient cooker available for continuous cooking applications that require up to 4,400 square feet of heat transfer surface. Low agitator rpm means gentle cooking action. A full-length vapor dome provides more area for vapor release, allows less entrainment and better cooking.

Continuous Hydrolyzor™

The Dupps Continuous Hydrolyzor (middle right) is the choice for consistent high quality products on a continuous basis at capacities up to 30,000 lbs/hr. Every part that touches product is constructed of stainless steel. Proven, reliable screw feeder technology provides a positive seal for the hydrolyzing vessel, and a steam heated agitator shaft ensures optimum heat transfer and steam efficiency. Valve-controlled product discharge maintains proper residence time and minimizes steam use. An advanced Programmable Logic Controller provides maximum control.



Batch Cooker

Available in capacities between 200 and 240 cubic feet, the Dupps Batch Cooker (bottom right) is ideal for heavy duty applications like blood drying and hydrolyzing. The toughest and most rugged herringbone gear reducer drive available provides trouble-free processing under the heaviest loads. A strong, easy-access underframe simplifies piping and cleaning. Overlapping agitator arms are pitched forward to move material continuously toward the discharge end of the cooker and assure thorough agitation. A special arm is used for feather processing.





Discor™

With up to 6,000 square feet of transfer surface, the large-capacity Dupps Discor disc-type cooker/dryer (above) gives more capacity per square foot of floor space than conventional cookers or dryers. An internal closed loop condensate system prevents condensate and non-condensable gas build-up for more efficient heat transfer.

Ring Dryer

This flash dryer grinds, dries, conveys and produces heat . . . all in one system that handles any material that can be entrained but won't stick to the duct work during drying. Because it exposes the material to heat for only a few seconds, the Ring Dryer (top right) gives you a cool product, ready to bag or store, with accurate moisture content and no wet spots. And because it recirculates 50% of the heated drying air, you save on fuel costs. The Ring Dryer is also available in an airless configuration.



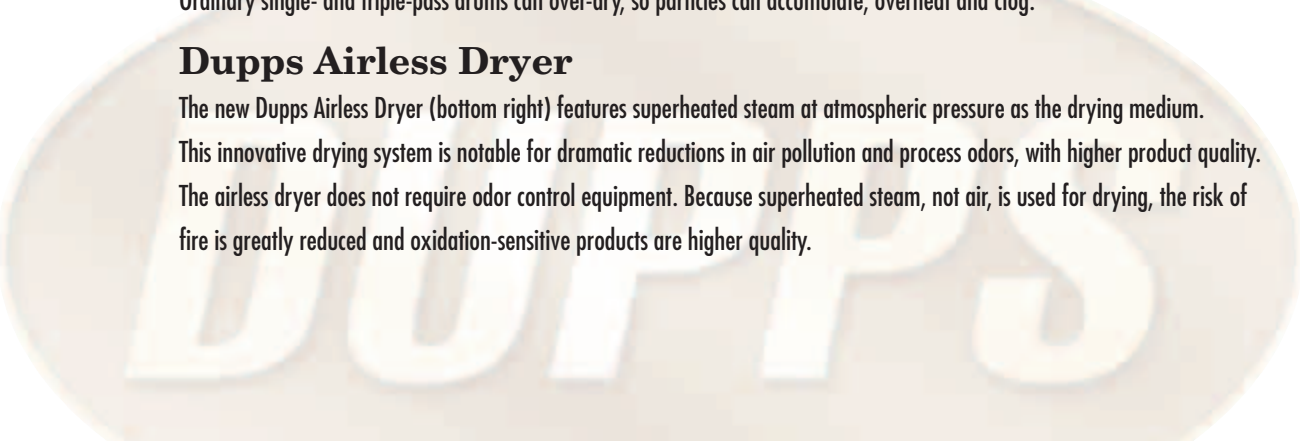
QuadPass™ Four-Zone Rotary Drum Dryer

The revolutionary QuadPass dryer (middle right) provides lower VOC emissions, more uniform drying, better product color and reduced fire danger compared to conventional single- and triple-pass rotary drum dryers. The unique QuadPass drum dries each particle of material at its individual drying rate—regardless of size, density or moisture—without overheating or volatilizing. Ordinary single- and triple-pass drums can over-dry, so particles can accumulate, overheat and clog.



Dupps Airless Dryer

The new Dupps Airless Dryer (bottom right) features superheated steam at atmospheric pressure as the drying medium. This innovative drying system is notable for dramatic reductions in air pollution and process odors, with higher product quality. The airless dryer does not require odor control equipment. Because superheated steam, not air, is used for drying, the risk of fire is greatly reduced and oxidation-sensitive products are higher quality.



Evaporator Systems



Retrofit Evaporator System

This system uses the waste heat in the cooking vapors of a continuous system. The waste heat removes water from raw material under vacuum, increasing system capacity and steam efficiency. The system employs a Preheater, Drainor and Prepressor to provide the evaporator's feed stream. Evaporator discharge joins solids from the Prepressor in a Supercookor for finish cooking.

Dupps Thermsavor™ System

Raw material — finely ground and fluidized with recycled fat — is the feed stream for this double-effect evaporator system which cooks the material under vacuum before fat/solids separation. The use of waste heat improves steam efficiency over conventional single cooker continuous systems. Low temperature operation insures top-quality product. Third effect options are available.

Dupps Grease System

This Dupps system uses an evaporator to remove water from restaurant grease. The heat source can be live steam or waste heat from a cooker. Dry grease from the evaporator is fed to a decanter-type centrifuge for solids removal, and is then ready for storage. State-of-the-art controls help maintain superior product quality.



Common types of evaporators

Falling Film Evaporator

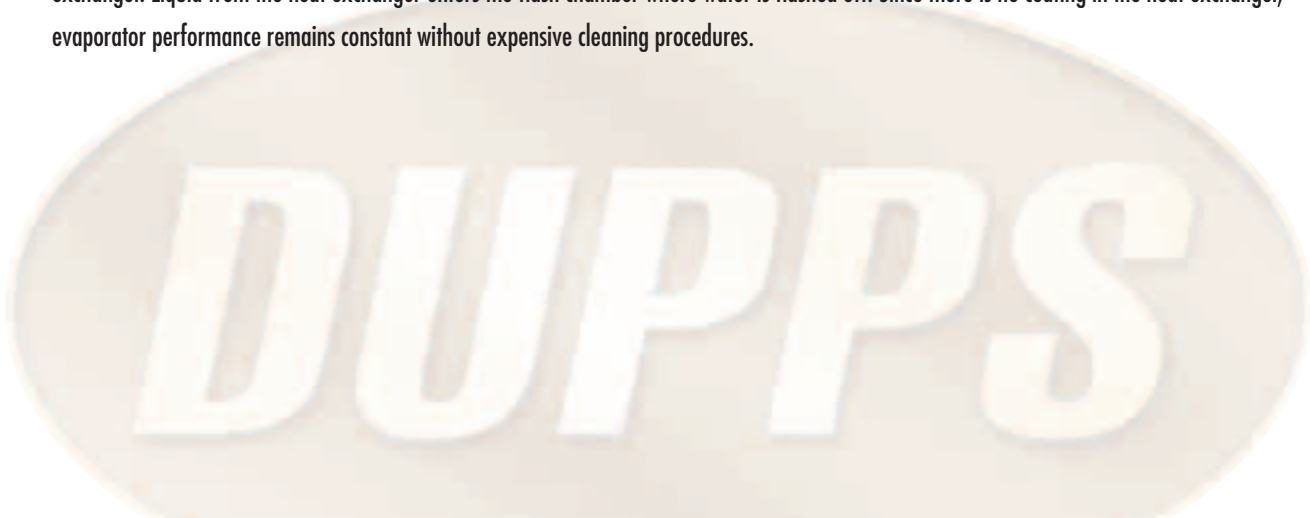
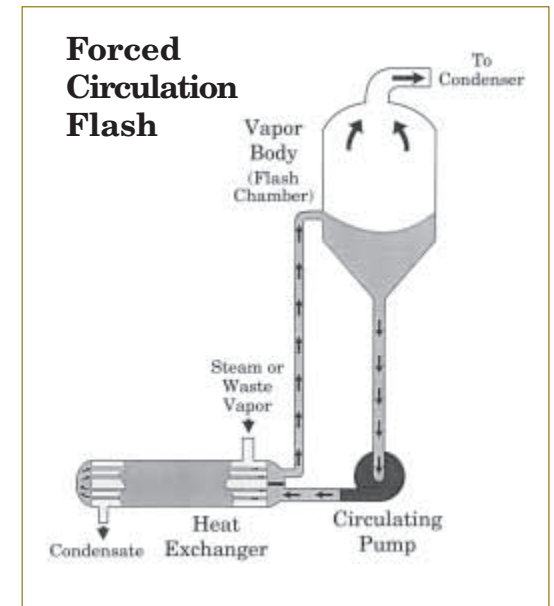
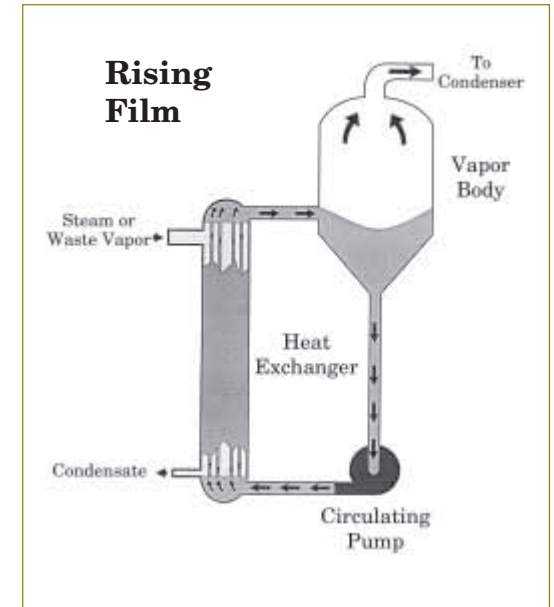
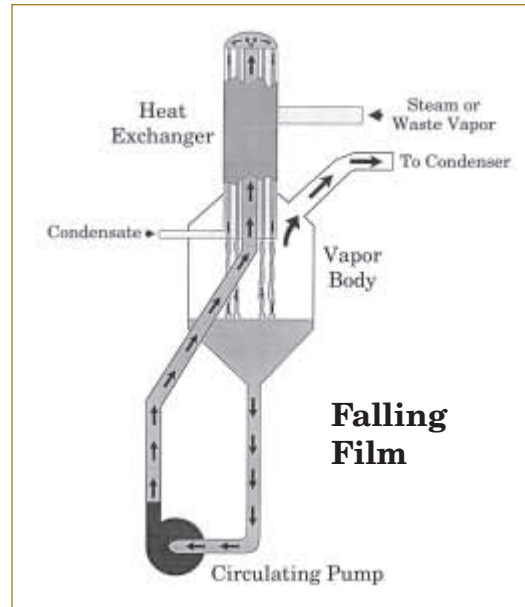
A conventional falling film evaporator (top near right) is suitable for non-fouling applications where tube coating is not a problem. A vertical shell and tube heat exchanger is mounted directly above an integral vapor separator. Evaporator liquid is circulated through the tubes by a pump beneath the vapor separator. The heat source is on the shell side of the heat exchanger.

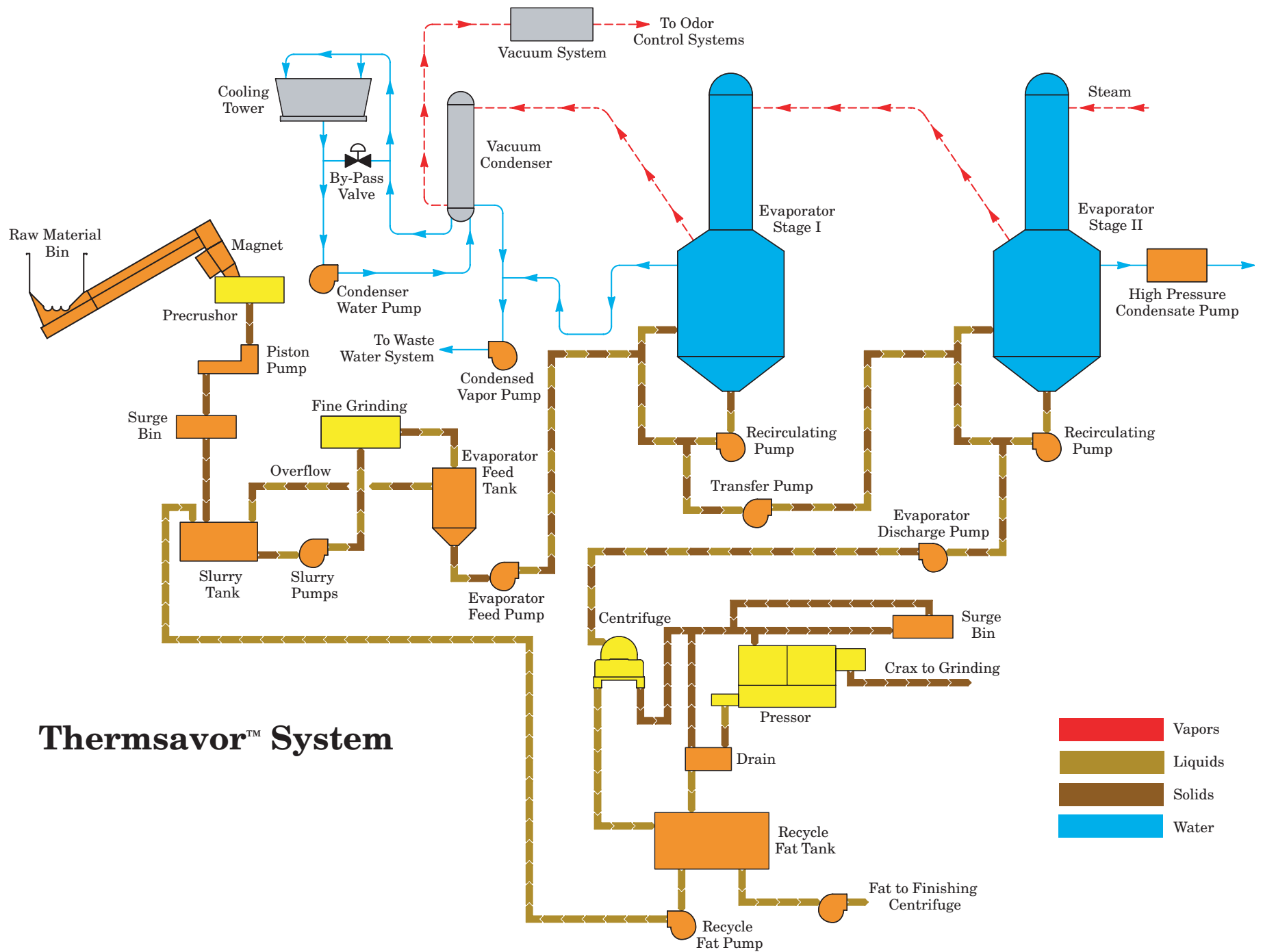
Rising Film Evaporator

In a rising film evaporator (top far right), the heat exchanger is mounted vertically and the evaporator liquid flows upward through the tubes. Temperature in the evaporator liquid builds as the liquid rises. This boiling action helps force liquid up and out of the tubes. The liquid and vapor leave the heat exchanger together and enter the vapor body. After vapor separation, remaining liquid flows from the vapor body through the circulating pump to the heat exchanger.

Forced Circulation Flash Evaporator

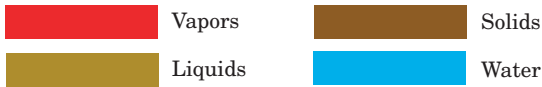
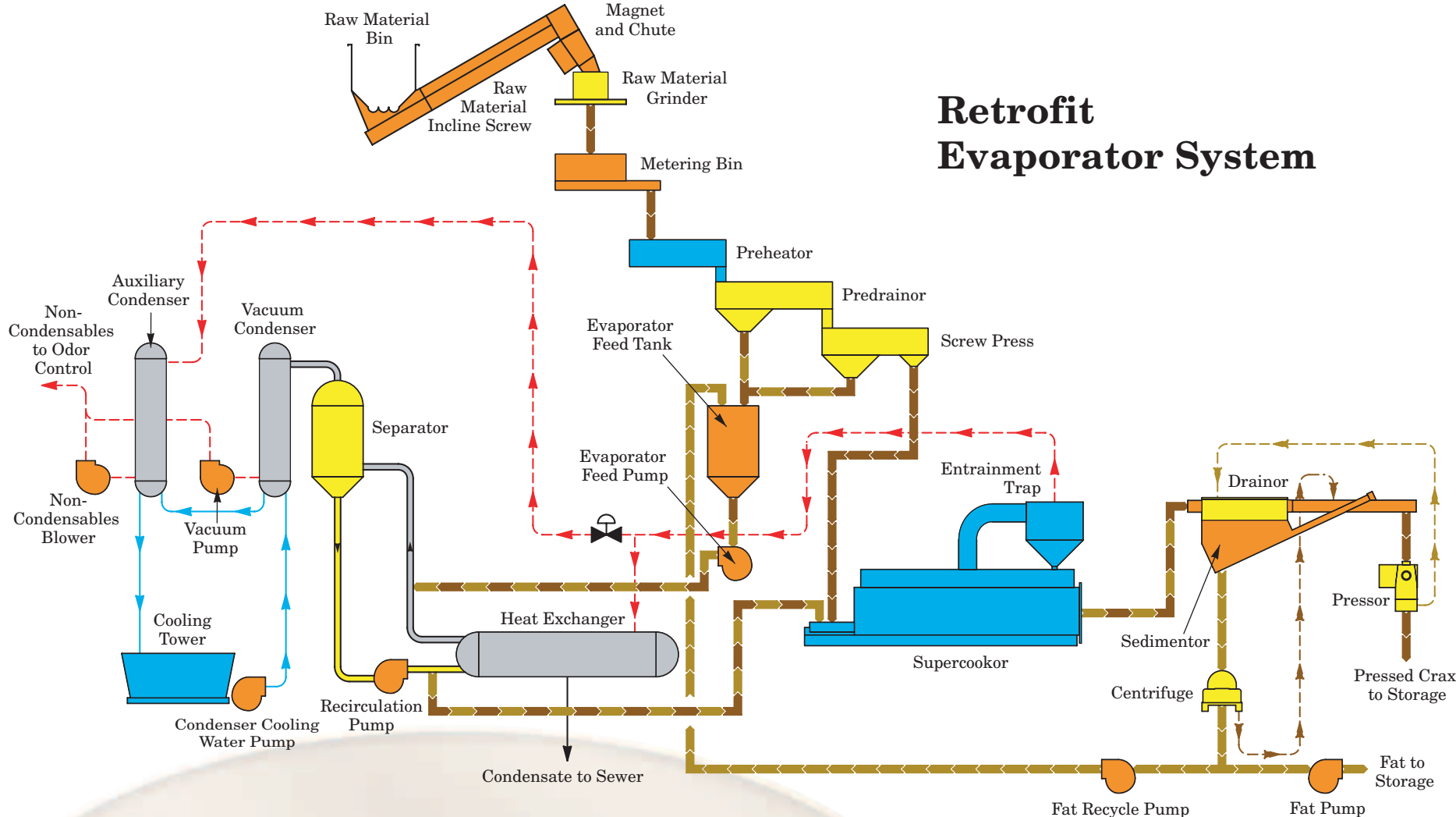
For applications where tube coating is a problem, the preferred choice is a forced circulation flash evaporator (below right). The main components are a horizontal shell and tube heat exchanger, a flash chamber mounted above the heat exchanger, and a circulating pump. Evaporator liquid circulates through the heat exchanger tubes at high velocity to inhibit coating and enhance heat transfer. The heat source is on the shell side of the heat exchanger. Liquid from the heat exchanger enters the flash chamber where water is flashed off. Since there is no coating in the heat exchanger, evaporator performance remains constant without expensive cleaning procedures.





Thermsavor™ System

Retrofit Evaporator System



Screw Presses



Pressor® Screw Presses

Pressor® screw presses feature Tuff-Cast™ flights

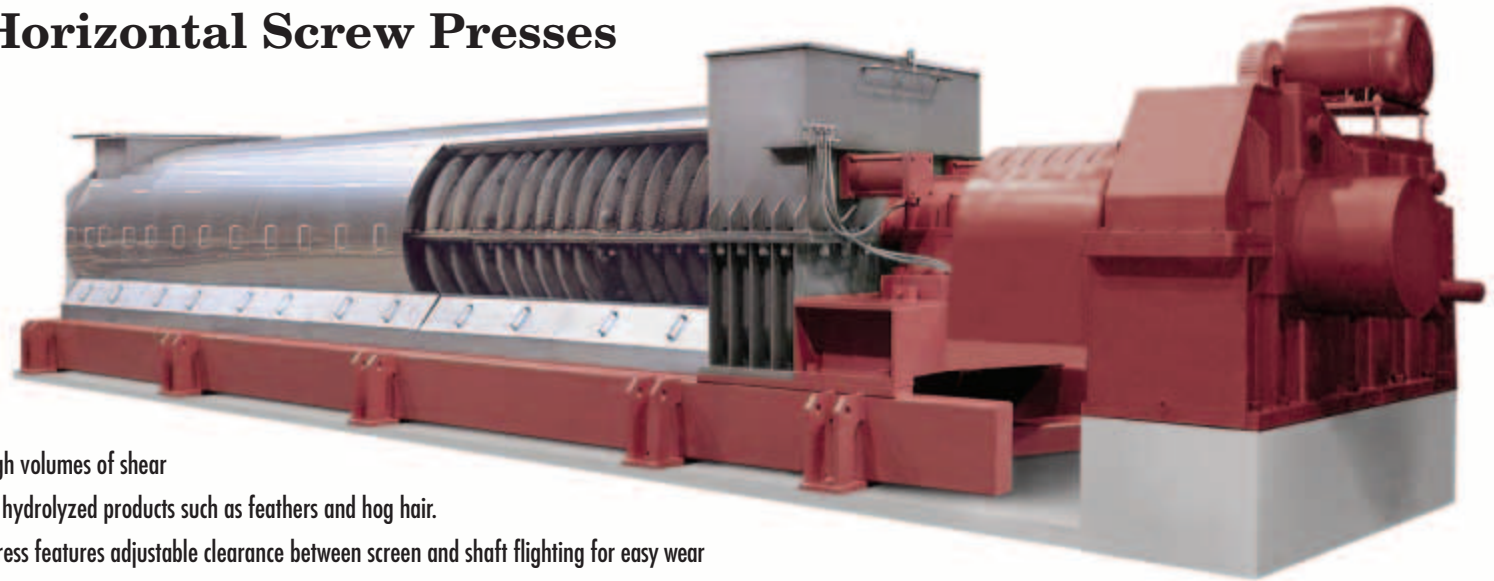
Made with a patented bi-metallic casting process, Tuff-Cast flights feature a hard, wear-resistant surface bonded to a softer core. The result is dramatically increased durability and shaft life.

Dupps Pressor high pressure screw presses are available in a wide range of sizes and configurations, from the largest, a high-throughput 13" shaft model, to a compact and efficient 7" unit ideal for smaller plants. Designed to produce lower residuals from a variety of materials, Pressors are available with horsepower ratings between 30 to 300 HP. A variety of shaft designs—including PRC (Press Release Cut), CT (Continuous Taper) and the original Dupps Pressor shaft—allow you to match shaft profile to feed stock materials and operating conditions to achieve the ideal residual content and greatest throughput. All Pressor models offer proven reliability, rugged construction and feature a single motor to drive all mechanical parts. Other features include:

- An eye-level feed hopper and simplified design to assure easy surveillance
- A rugged gear box (designed and built by Dupps) and heavy-duty bearings that run in oil to minimize maintenance
- A gallery-type lubrication system to assure an oil supply without a pump
- A hydraulically operated automatic choke that can be easily varied at the control panel
- All-steel, heavy-duty construction provides lifetime service.



High Volume Horizontal Screw Presses

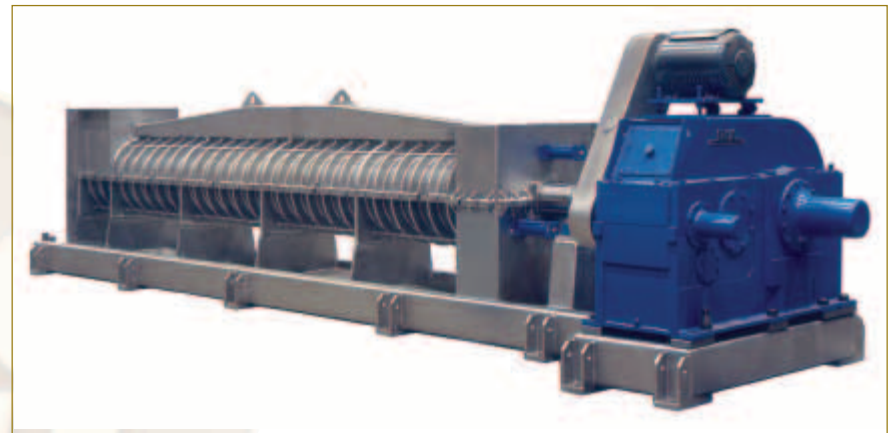


Here you will find your best choice for high volumes of shear sensitive materials, including slurries and hydrolyzed products such as feathers and hog hair.

The Dupps medium pressure horizontal press features adjustable clearance between screen and shaft flighting for easy wear compensation, a pneumatic choke with torque limiting device for lock-up protection, multiple reduction gear box with automatic variable speed drive. In addition to an exceptionally strong frame and heavy cage construction, you'll get a base-mounted (not shaft-mounted) gear reducer, and an automatic variable-speed screw control to compensate for material feed changes. Other important features include

- A uniquely tapered stainless steel screw shaft
- Replaceable wear shoes on shaft flights for greater durability
- Heavy-duty bearings for shaft support and thrust loads
- Distinctive chute design for easy feeding
- Unique center drainage design
- Steam can be used in the shaft for additional cake dryness
- ASME code stamped.

Special Dupps screw presses have even been approved by the U.S. Department of Agriculture's Food Safety and Inspection Service for processing edible products in federally inspected meat and poultry plants.



Process Controls



Hard-Wired Relay Controls

These controls (above) feature push-buttons, relays, interlocks, timers and load meters. Basic PID Loops can be added to the hard wired controls — individual PID controllers monitor and manage cooker temperature, raw material feed rate, cooker level, vapor pressure, cooked material discharge rate and steam flow.

ICIS[®] Automated Process Control

This advanced control system (top right) uses a Programmable Logic Controller. The operator interface consists of a desk and pre-programmed, simple-to-use personal computers with animated process graphics. The ICIS (Integrated Control and Information System) monitors and controls temperature, product level, weight, speed, pressure, flow rate, and motor load. It also gathers real-time data for monitoring the process and stores it for later management analysis, providing information on virtually every operating parameter that affects quality, throughput and efficiency. You can display this data on personal computers at the plant or at remote sites, and even connect directly to Dupps engineers.



The Motor Control Center

Used on both hard-wired and ICIS controls, the Dupps Motion Control Center (bottom right) is built in compliance with National Electric Code (NEC) and is inspected and approved by Underwriters Laboratories. The enclosure features NEMA 12 construction with conduit raceway and a lockable master door system. All motor circuit breakers, starters, VFDs and soft starts are also NEMA rated. Control wiring is segregated from power wiring for short circuit protection.



Service — Our most important obligation

“Dupps Won’t Let You Down” is the promise we make to every customer. We fulfill this pledge with the largest and most experienced rendering system service and support team in the industry.

Our staff of full-time Field Service Technicians is expert in every aspect of maintenance and repair of rendering equipment (including welding capability that meets ASME Code Section VIII requirements) and has in-depth experience in rendering plant operation. With all the specific tools necessary to maintain, repair and upgrade Dupps machinery properly and efficiently, we can quickly bring your system and equipment up to peak efficiency with a minimum of downtime.

The Dupps Parts Department, with a full inventory of maintenance and repair parts, stands ready for the fastest possible response, often within twenty-four hours of a call. Because replacement part availability is critical — even a small, inexpensive part can shut a plant down — our customers can call Dupps twenty-four hours a day, seven days a week. If needed, parts can be shipped overnight or loaded onto one of our own trucks for immediate shipment. This also means that customers don’t need to keep a large spare parts inventory themselves, because they can rely on Dupps to have parts in stock.

The Dupps **VIP** (Vessel Inspection Program) is a comprehensive schedule of planned equipment maintenance and periodic evaluation to minimize downtime throughout the service life of Dupps equipment. If you own a Supercooker®, Equacooker® or Dupps batch cooker, the Dupps **VIP** is your best assurance of continued dependable performance. **VIP** includes a complete regimen of the inspections, reports and recommendations you need to monitor and evaluate the condition of cooker pressure vessels. Periodic inspection, normally once a year, is vital because process materials gradually wear down a vessel’s tube walls, stiffeners and inner shell, and wash away weld metal. Eventually, this reduces the vessel’s operating pressure rating and structural integrity. With **VIP**, customers get all the information they need to avoid failure and expensive downtime, as well as meet OSHA 1910.119 requirements for the mechanical integrity of pressure vessels.



Find it all at Dupps.

Dupps offers the protein co-products industry the world's most complete line of rendering systems and machinery. And that's just the beginning. Dupps engineering skills, process development experience and manufacturing capability handle your specific requirements whether you need one piece of machinery, an integrated system or a turnkey processing facility.

Come see for yourself

We invite you to tour the Dupps headquarters and manufacturing complex before you make your investment decision. You'll discover advanced production facilities and complete service capability — and meet our people whose skill, loyalty and pride have made our company the best in the business.



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