

Conventional immersion chambers result from pumping fluid from a sump to a dammed roller conveyor chamber. The solution is re-circulated at a rate of approximately 5X VPM (chamber volume per minute) via manifolds positioned between the conveyor rollers to displace depleted chemistry and trapped gasses. This combination of flooded jet and roller wheel transport results in chaotic turbulent zones within a stagnant bath. By contrast, **Streamline** Fluid Engine immersion chambers have no rollers and provide laminar solution flow at a 100X VPM, resulting in faster, more uniform reactions.

Streamline Fluid Engine Pat.Pend

The engine comprises two plates closed at each side to form a narrow chamber. Fluid containment rollers, mounted at the entrance and exit of the chamber, push and pull both flexible and rigid materials through this chamber. Fluid is injected



at the centre of each plate via continuous slots or knives, resulting in steady boundary layers balancing and guiding material in transit. The leading



and trailing edges of the plates are shaped to take advantage of Coander effect, diverting the boundary layer diffusion point away from the panel entry and exit zones. This maintains the streamline flow and diverts fluid above the plates, preventing flooding and material deflection.

While the Laminar Flow Fluid Engine application is central to the Streamline Range many other patented technologies developed during the Alchemy and Lynk development programs have been incorporated.

Streamline Rinse Knives

These short fluid knife flood zones isolated by dual or triple EPDM Rollers provide rinsing between processes. Rinse efficiency is a function of the volume of water applied. The fluid knife delivers re-circulated rinse water at double the flow typically used in conventional rinses while occupying a fraction of the space.

Jet Knife Dryer

Designed for lower conveyor speeds, the parallel knife drying head requires minimal space. High velocity angled jets of air heated by the integral side channel blower provide complete drying at speeds of up to 1.5 metres per min.

Inclined Fluid-Knife Dryer

For higher conveyor speeds and thicker materials the inclined fluid knife dryer provides unparalleled drying. Precision, fixed knives deliver high velocity air heated by the inverter controlled side channel blower, ensuring a complete drying solution for any material from flex circuit to back panel.



The Streamline range

Today's expectation of **more for less** has forced our competitors to supply equipment manufactured in low cost manufacturing zones. Cemco's response to this challenge is to provide **more from less**. This concept has resulted in a small increase in hardware manufacturing cost per metre but a large increase in capacity per metre.



This new product range takes its name from the unique laminar or streamline flow treatment chambers that replace conventional flood and spray chambers used in earlier designs. These fluid engines result in faster and more uniform reaction, reducing processing time and equipment footprint. This is only one of the unique features that make the **Streamline** range smaller, more efficient and more capable than conventional equipment....

FEATURES FROM TOP...

Sliding top covers provide fast, clear access to any section of the machine.

Cross-flow extraction. Front and rear porting is provided between the sliding top cover and the inner condenser plates and extends throughout the full length of the system. Air is drawn from the front of the machine by a demountable rear duct, eliminating fumes with minimal solution drag-out.

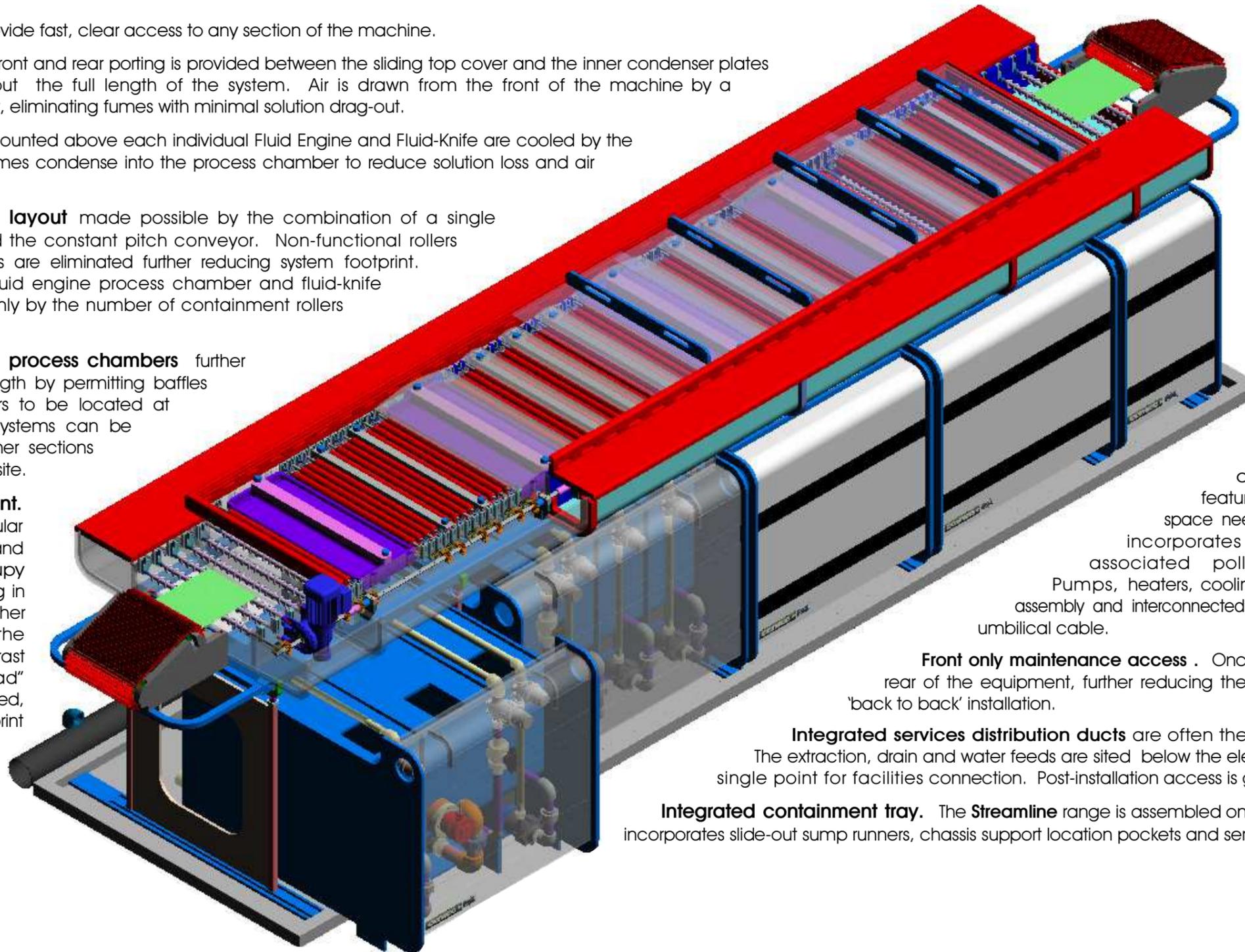
Fume Condensers mounted above each individual Fluid Engine and Fluid-Knife are cooled by the cross flow exhaust. Fumes condense into the process chamber to reduce solution loss and air pollution.

Free-form chamber layout made possible by the combination of a single process chamber and the constant pitch conveyor. Non-functional rollers of conventional designs are eliminated further reducing system footprint. The proximity of the fluid engine process chamber and fluid-knife rinse head is limited only by the number of containment rollers specified.

Continuously welded process chambers further reduce the system length by permitting baffles and process chambers to be located at any pitch. Extended systems can be supplied in bolt together sections or extrusion welded on site.

Asymmetric alignment.

In conventional modular design the sump and process chamber occupy the same space resulting in non-functional areas either above or below the conveyor. By contrast these normally "dead" areas are fully utilised, therefore reducing footprint of the system.



De-coupling chassis. The upper conveyor/process chamber assembly is supported and located on chassis rails that permit movement in the long axis. By decoupling the process chamber and sump, warp, twist and yaw resulting from heating and cooling is eliminated. **Streamline** board handling equipment can be plugged into the chassis rails and support legs provide leveling adjustment at the top of the leg away from spills.

Slide-out sumps. Each slide out sump assembly is connected to its associated upper process chamber via flexible delivery hoses and demountable rigid return ducts. This feature facilitates cleaning and reduces the space needed for maintenance. Each fabrication incorporates the 'process stage' tank(s) and any associated pollution control and rinse stages. Pumps, heaters, cooling coils and controls are attached to the assembly and interconnected to the remote controls via an extendable umbilical cable.

Front only maintenance access . Once installed there is no need to access the rear of the equipment, further reducing the footprint and enabling 'back to wall' or 'back to back' installation.

Integrated services distribution ducts are often the responsibility of facilities engineering. The extraction, drain and water feeds are sited below the electrical interconnection duct, providing a single point for facilities connection. Post-installation access is gained by removal of the sumps.

Integrated containment tray. The **Streamline** range is assembled on a polypropylene bund tray fabrication that incorporates slide-out sump runners, chassis support location pockets and services mountings.

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