

A large, high-speed photograph of a water splash, showing a column of water rising from a surface and creating a crown-like shape with many bubbles and droplets. The background is a light, textured blue.

the
clear
choice

parts washing

surface treatment

precision cleaning

degreasing

passivation

penetrant inspection

Immersion Technology—The RAMCO Difference

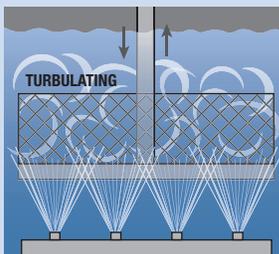
RAMCO Immersion Technology is defined as the use of a combination of mechanical motions within a liquid bath or drying chamber to facilitate a specific process objective.

The process can be general cleaning for applications like degreasing, precision cleaning, or stripping. The soils to be removed typically are oil, grease, dirt, smut, chips, polishing compounds, carbon, paint, ink, wax, casting residues, oxides, etc.

The process can also involve surface treatment, surface preparation, penetrant inspection or other procedures where parts are immersed in a liquid processing chamber.

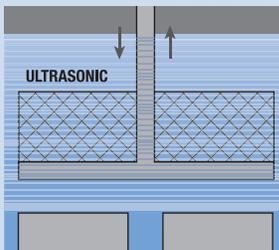
The key to the RAMCO system is the effective use of an elevator within each processing chamber. The elevator is used to transport the work into and out of the chamber but its most important function is to continuously move the work within the processing zone. **It is this dynamic function that allows RAMCO systems to achieve superior results in washing, rinsing and drying.**

We call this **Dynamic Flow Combination**. The effect of Dynamic Flow Combination is better coverage of component surfaces (minimizing standing waves and/or part shadowing) producing more consistent results and accelerated processing times.



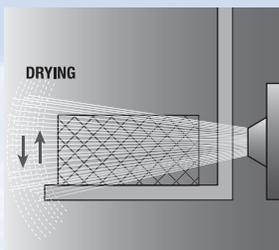
TURBO WASHING and RINSING

Combining platform oscillation with solution turbo (spray under immersion) results in constantly changing flow patterns. RAMCO turbo systems are proven to accelerate processing time.



ULTRASONIC CLEANING and RINSING

Using platform oscillation to gently move parts throughout the ultrasonic working zone provides a superior cleaning action over conventional systems by moving the work through the peaks and nodes of the wave energy. Ultrasonic cycles are sequenced with turbo cycles (above) to further accelerate the process.



HOT AIR KNIFE DRYING

Using high volume hot air combined with changing air flow patterns created by the oscillating elevator provides accelerated drying cycles without excessive heating.

RAMCO Immersion Technology is offered in different sizes, weight capacities, and configurations (including automation) to accommodate a wide variety of applications. The standard **MK Series** is designed for loads up to 150 pounds with an MK/HD (Heavy Duty) Series for loads up to 300 pounds. The standard **CM Series** is designed for loads from 500 up to 2000 pounds and is custom built for loads up to 5000 pounds. The **Console Series** are compact multi-station (wash/rinse, wash/rinse/dry, etc.) versions of the MK Series for loads from 50 pounds (and less) up to 150 pounds. **Automation** can be added onto any of the three series at the time of manufacture or built to be retrofit using patented RamTough Automation.

MK Series



Immersion in a liquid bath is the simplest way of covering surfaces. It is indeed the most common form of parts washing. It is also the simplest way of covering irregular surfaces and reaching intricacies and the inside of hollow forms with a cleaning solution. RAMCO Immersion Technology begins with **platform oscillation**. With each oscillation of the platform elevator mechanical force consistently moves fluid over surfaces and disperses contaminants while applying fresh solution to newly exposed surfaces.

Platform oscillation is an easy, reliable and cost effective way of accelerating cleaning action.

The MK Series uses a simple and rugged pneumatically powered oscillating platform. Our standard pneumatic oscillation package includes a RAMCO Floating Cylinder. This patented design allows the entire cylinder to articulate ("float") while in use. It greatly reduces wear. Each processing chamber has its own elevator to automatically transport the work in and out of solution. The elevator moves the parts into position and oscillates with either a short or long stroke. A two position selector switch is used for either long 5 to 9 inch or short 2 to 4 inch strokes. The long stroke is used to provide better flushing by forcing media (solution or hot air) through the working area of nested masses or complex part shapes with recessed passages and/or blind holes whereas the short stroke is used to provide quicker oscillations and faster processing of simpler parts.

MKs take up a minimum of floor space and can handle a wide assortment of part sizes and configurations. A broad spectrum of cleanliness levels can be satisfied. Starting with the basic transport elevator you can integrate additional features to meet your requirements. From a small cell to a fully automated final precision cleaning line, the MK Series does it all.



CM Series

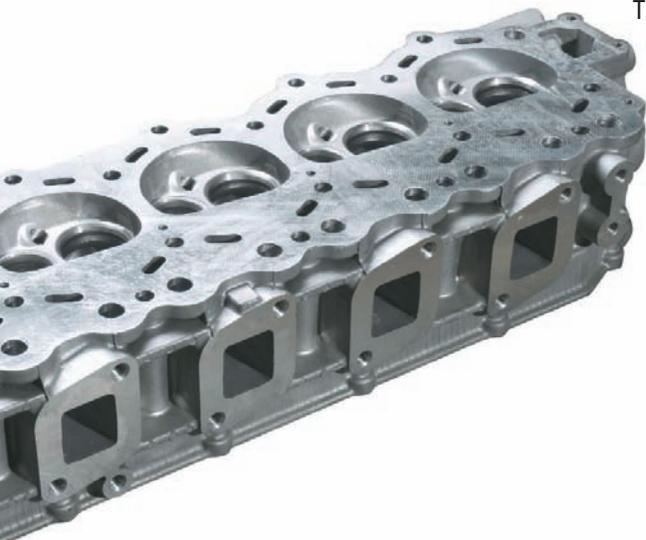


The CM Series is designed for heavy loads from 500 pounds to 5000 pounds. The construction is heavy gauge, steel or stainless steel. The outer tank lip is flanged and raised to trap solution and minimize spillage onto exterior walls. Structural girths are provided around the perimeter of the tank. The tank is double welded in critical locations for added strength. The tank bottom is welded onto I beams. The rear wall, external structural angles and tank bottom are welded together to form a *unitized fabrication that transfers load forces to the ground.*

The transport elevator is engineered for maximum strength using structural channel and I beam with heavy section modulus and/or formed channel. It tracks on internal structural angles with large UHMW bearings to transfer the weight load to the rear wall and ground. Roller bearings are mounted externally at critical locations to evenly distribute the load and eliminate cylinder maintenance. The elevator will not jam. There is no worry about eccentric loading. There is no cylinder wear. This design provides superior structural stability and longevity.

The CM Series has the unique feature of combining variable lengths of stroke with variable speeds of stroke to create an infinite number of motion combinations to handle a variety of applications. It uses a simple and time tested pneumatic oscillating circuit. Speed and stroke controls are infinitely variable with agitation speeds in excess of 250 strokes per minute. The standard RAMCO pneumatic package includes only NFPA (National Fluid Power Association) cylinders and components to provide the highest reliability. Our design virtually eliminates cylinder wear for years of trouble free service.

The CM Series can handle a wide assortment of part sizes and configurations. A broad spectrum of cleanliness levels can be satisfied. Starting with a rugged basic oscillating parts washer you can integrate additional stages and features to meet many requirements including full automation.



Console *Series*



RAMCO Immersion Technology sets the standard for modular multi station systems with the compact Console Series.

The Console Series provides all the versatility and flexibility of the MK Series within a minimum footprint. They are the first industrial *strength consoles* built solely for the factory floor and the rigors of production. These are sturdy and reliable machines with an excellent track history for meeting production requirements. Each processing chamber includes a transport elevator. The Console Series is designed for loads from 50 pounds (or less) to 150 pounds per stage.

The layout is unlike conventional consoles. Nothing is placed underneath processing tanks or tucked behind “access” panels. Piping, control valves, pumps, filter housings, pneumatic cylinders, heating elements, ultrasonic generators, etc. are all located outside the console, clearly visible for inspection and access. Preventative maintenance and periodic service are easily accomplished.

Each console is designed to accept a broad range of auxiliary items, making it adaptable to a wide variety of applications and cleanliness specifications.



Automation



RAMCO manufactures two automation systems depending upon the requirements of the process—RamTough and RamNet. Both systems feature our **patented multi-arm walking beam** with simultaneous transfer of all baskets for maximum productivity. Each system is built on a heavy duty I beam fabricated base for accuracy, stability, and ease of shipping and installation.

RamTough is the basic workhorse of the RAMCO automation line. It is a robust, cost effective, easy to operate, and long-lasting automation package with a proven track history in high production applications. Baskets are recognized by the system using proximity sensors on the infeed conveyor. The walking beam assembly moves the baskets through the system using multiple arms that articulate ninety degrees at the beginning and end of each cycle and move left and right on linear bearings over hardened steel shafts. Transfer is very accurate and smooth. The automation PLC is pedestal mounted for convenience and ease of operation.

An exclusive RamTough feature is **the ability to retrofit** a basic RAMCO immersion washing system to full automation without modification. It gives you the flexibility to groove in and tailor a process (easily adding features or stages if required) before fully automating.

RamNet is a state-of-the-art network of microprocessors. Each stage has its own microprocessor installed and internally wired to all local devices related to that stage. Timers, heaters, sequencing covers, elevators, pumps and optional features like ultrasonics are all microprocessor controlled. A main CPU is located in an Operators Control Station. All the microprocessors are linked via ethernet and integrated to the CPU so that they “talk” to each other. A RamNet system can process multiple baskets side by side, *each running on a different program* or recognize lighter and heavier loads and automatically change pneumatic pressures from stage to stage. A cable modem is included with each RamNet system for on-line debugging, reprogramming, or system monitoring.



A Network of Specialists

At RAMCO, we believe that our specialized know-how, spanning over 75 years in this industry, is a valuable asset to any customer. To that end, we've invested considerable time, effort and commitment into establishing, training, and maintaining an outstanding distributor network. These men and women are **cleaning specialists** experienced in process development, equipment selection, chemical selection, wash and rinse water treatment, installation, training, and support.

Our combined effort is focused on providing the most modern cleaning, degreasing, and chemical processing systems at the lowest cost per part and with the highest regard for worker safety and the environment.

You can look to our distributors as team members and valued advisors, guiding the process in coordination with your staff. And our expertise is simply part of the package. When you choose RAMCO, knowledge and experience are on your team, at work for you.



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