



**AQUEOUS**  
**CLEANING SYSTEMS**

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## WHAT WE DO:

In the simplest terms: we clean parts and components for manufacturers, re-manufacturers and service providers. JRI/Jenfab manufacturers, re-manufacturers and services applications capable of meeting stringent cleanliness specifications within a number of sectors, including the automotive, aerospace, and medical industries.

JRI's strength is in heavy equipment and general cleaning, such as cleaning heavy oils

from 10,000 lb. parts within the oil and gas industry. Jenfab resides on the opposite end of the spectrum, honing its expertise in precision cleaning, such as removing sub-100 micron particles from blind holes for the aerospace sector. The ability to combine both company's unique trade knowledge has resulted in JRI/Jenfab having the most extensive product line of aqueous cleaning systems on the market.

**AQUEOUS CLEANING OFFERS AN ENVIRONMENTALLY SUSTAINABLE ALTERNATIVE TO SOLVENT SYSTEMS.**

## WHY AQUEOUS?

## WHO WE ARE:

Both JRI Industries and Jenfab are in the business of offering solutions for parts and component cleanliness in all aspects of industrial cleaning. In reality, we are much more than that—we are a tight-knit team of engineers and fabricators dedicated to our craft and our clients. We pride ourselves on our craftsmanship, which is reflected in our end product.

Between the two brands, we have more than 75 years of industry experience, manufacturing entirely out of Springfield, Missouri, and Berlin, Connecticut.

As we move ahead, we look forward to maintaining the client relationships we have developed while continuing to cultivate new ones. This is our ongoing goal.





# TOP LOADERS

The Top Loader line of equipment is perfect for cellular washing or for installations where floor space is at an absolute premium. This line features standard turntables ranging from 21" to 72" and, as custom, as large as 120". Standard features include vertical sealess pumps, a mechanical door seal, our industry-leading gear and sprocket driven turntable, and a plug-n-play design for easy installation.

These systems can include stainless steel construction options, rinse stages, and blow-off stages. Choose from our standard configuration or request information on our custom units.

As a custom application, these diverse machines can be designed with a turntable as large as needed and weight capacities to match. We can even index the turntable for robotic load and unload.

*\*TOP LOAD DESIGN IS OPTIMAL FOR OVERHEAD CRANE LOADING*



# F-SERIES

The F-Series commercial duty machine is built with price conscious customers in mind. This budget friendly option eliminates the need to manually clean parts with a pressure washer or scrub tub. Incorporating the same sprocket driven turntable system, mechanical seal, chip tray and swing down spray as the more heavy duty PCS & HDS systems, the F-series will provide years of maintenance-free usage.

## **Space Saver Design**

Several factors make the F-Series an ideal system for tight quarters. It allows for flush placement against a wall to save valuable floor space. Another benefit is the roll-in door design that allows for easy front and overhead loading, as well as a firm footprint that isn't increased when loading and unloading.

*\*ROLL-IN DOOR PROVIDES A MINIMAL FOOTPRINT.*



# PCS & HDS SYSTEMS



## STANDARD TURNTABLE DIMENSIONS

25"  
31"  
36"  
42"  
50"  
60"  
72"  
84"  
108"  
120"



## Standard Features

Our equipment includes the following standard features with longevity in mind: vertical pumps, mechanical door seals, roll-out turntables or v-notch doors for easy overhead load centering, low water shut-off, removable chip trays and swing away spray bars.

## Gear & Sprocket Driven Turntable

Our proven sprocket driven turntables eliminate chains, belts, tires and other friction drive systems that inevitably wear down over time. Our direct drive gear design insures consistent rotation and cleaning performance.

As part of our original product offering, the PCS and HDS lines of parts cleaning systems are both industry leaders. These systems not only provide precision part cleaning, but also reliability that make them keystones in the world of cabinet cleaning systems. With more than 20 standard systems ranging from 25" turntables to 120" turntables and weight

capacities from 500 to 10,000 lbs., we truly have the ability to cover most any cleaning need. In the rare case that standard will not work, our custom units can be designed with turntable capacities of 50,000 lbs., vertical door configurations, recirculating and fresh water rinse cycles, and ambient and heated blow-off options.

# VERTICAL CHAIN CONVEYORS

## *Versatile Design*

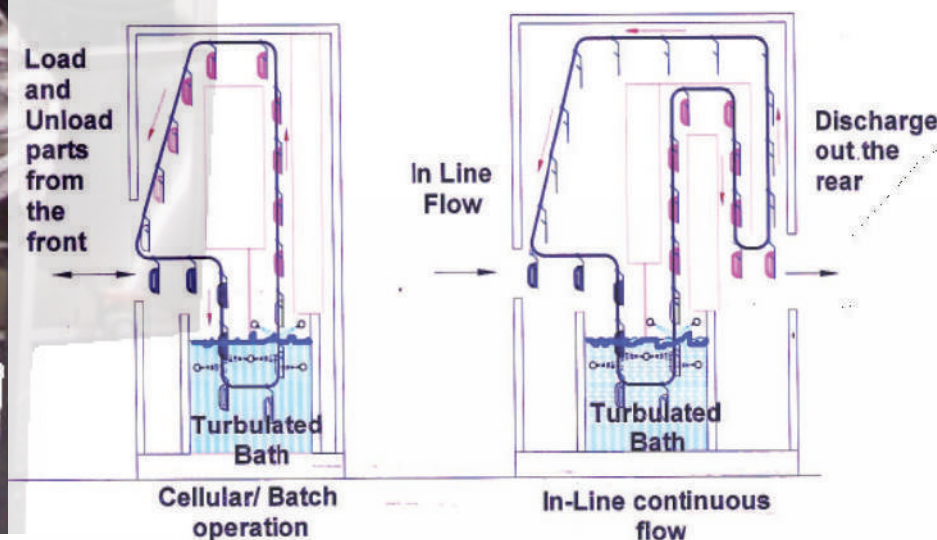
Vertical Chain Conveyor (VCC) systems can be configured two ways--as a front load, rear unload pass through system, or as a return to operator system.

The systems are also easily integrated with robotic or automated conveyor loading and unloading, making them an ideal replacement for single-flow cleaning applications with specifications that require immersion.

With the VCC unit, horizontal cross rods connected to a pair of stainless roller chains convey parts through various process stations. The vertical conveyance offered with this style of system reduces floor space requirements compared to horizontal belt conveyors and provides aggressive immersion cleaning in addition to spray cleaning action.

This chain conveyor is indexed on a programmable timed cycle to allow adequate time for cleaning and drying as well as loading and unloading of parts. After the parts are loaded, they are immersed into solution and continuously flushed by submerged spray jets. A high volume of solution is delivered around, through and into the parts being processed.

The immersion cleaning process of the VCC parts washer makes this machine naturally adaptable for use with optional ultrasonics. Parts can be transported through high energy ultrasonic tanks where the full power of the ultrasonic scrubbing action is focused directly on the parts for optimal precision cleaning of blind holes and difficult geometries.





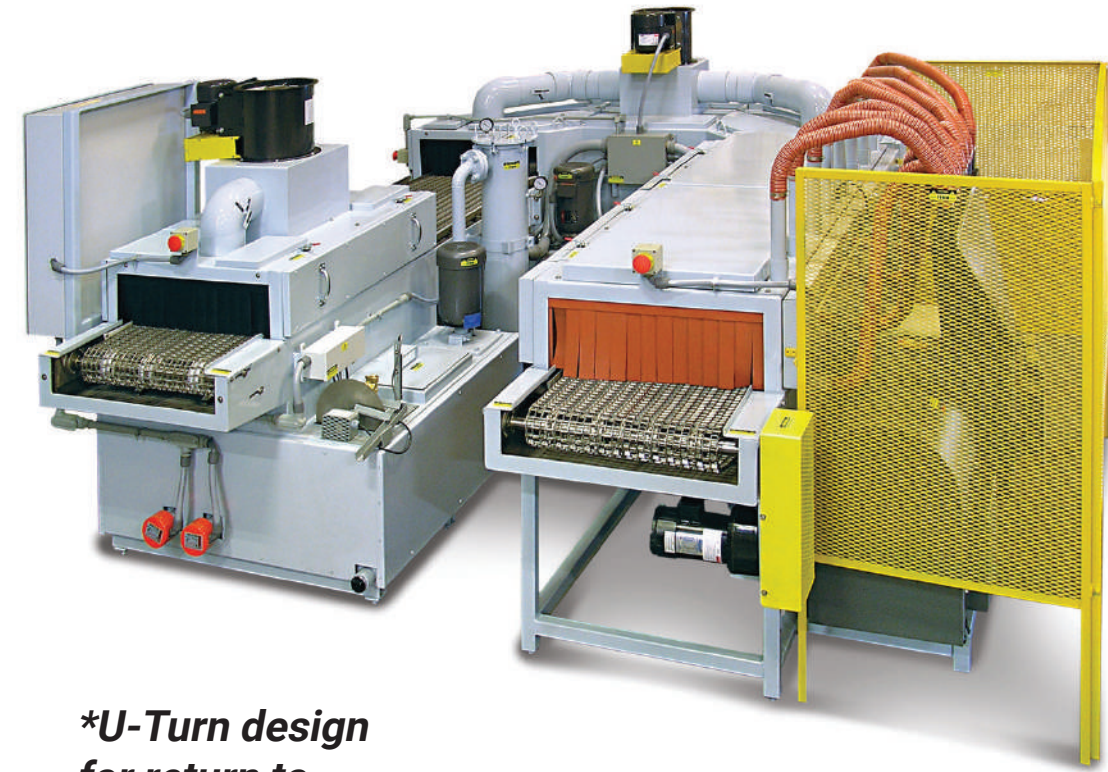
Whether you need 6" or 6' of belt width, one zone or five zones, JRI/Jenfab has the right solution for your application. Our belt systems can be fabricated from either mild or stainless steel and can be equipped to accomplish most any cleaning requirement in a pass-through, continuous flow system.



# BELT & CONVEYOR SYSTEMS

## **Lean Values:**

Engineered spray systems and recirculating dryer eliminate waste and non-value-added time from your manufacturing process while improving product quality and reducing energy and floor space requirements.



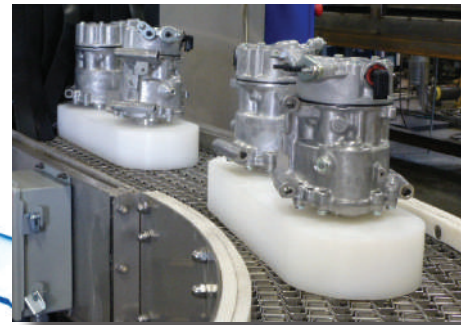
*\*U-Turn design for return to common area*



*\*Clip-on spray nozzles available for simplified maintenance*



*\*Multiple belt configurations available*

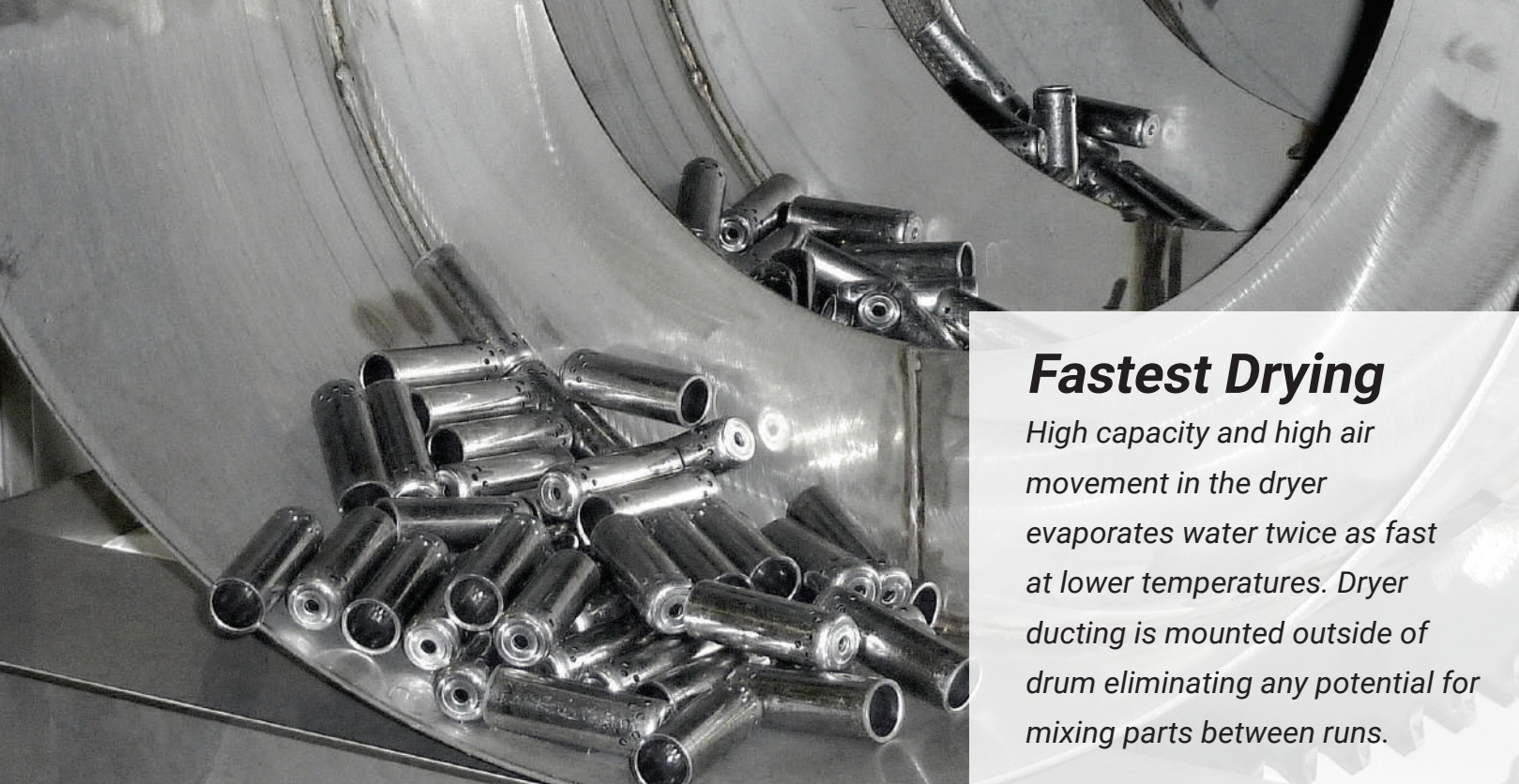


*\*Custom part fixtures for difficult parts*

## SEVEN

## STANDARD

**BELT WIDTHS: 6" 12" 18" 24" 30" 36" 48"**



### **Fastest Drying**

*High capacity and high air movement in the dryer evaporates water twice as fast at lower temperatures. Dryer ducting is mounted outside of drum eliminating any potential for mixing parts between runs.*



*\*Multiple wash and rinse stages available*

## **ROTARY DRUMS**

JRI/Jenfab rotary drum systems continuously feeds parts through a rotating drum. As the parts are advanced, they pass through cleaning, rinsing, and/or drying sections. This design enables a large quantity of parts to be economically processed.

The parts are gently tumbled in the aqueous solutions, providing a very effective method of

completely exposing all edges, surfaces and blind holes to both immersion and high pressure spray cleaning action.

Jenfab's engineered immersion and spray system has greater cleaning capability and uses less energy than other competitively-designed systems, resulting in lower energy consumption and a smaller footprint.

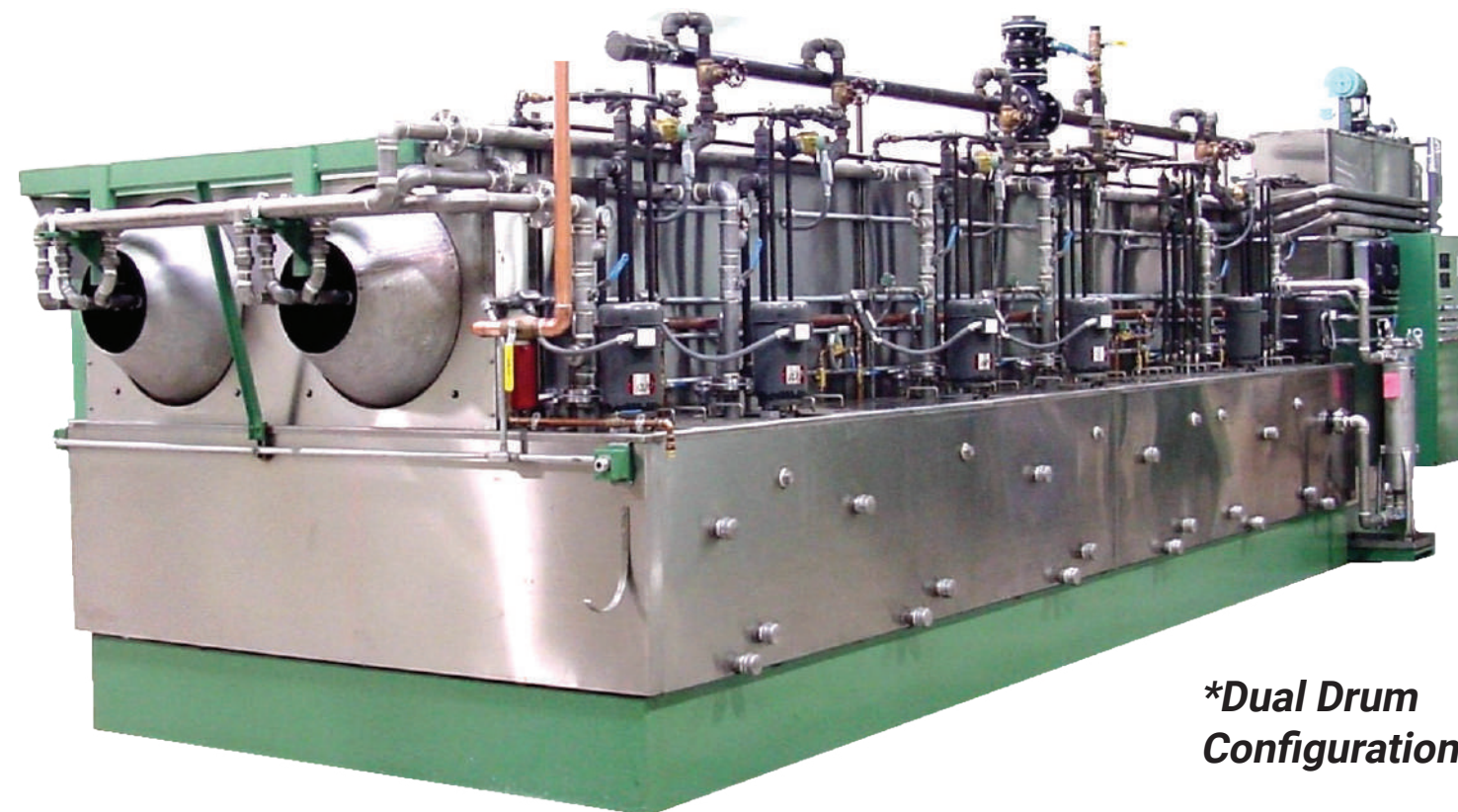
### **Six Drum Diameters**

*to choose from make it as easy for us to process five cubic feet of parts per hour in a 15" drum as it is to process over 200 cubic feet of parts in a dual 38" drum.*

### **Lower Maintenance Costs**

*Vertical, in-tank, seal-less pumps are protected with dual lift-out stainless steel screens. Lift-off top panels allow instant drum access.*

**STANDARD DRUM SIZES: 15" 19" 24" 30" 38" 42"**



*\*Dual Drum Configuration*



# DUNNAGE & TOTE WASHERS

Power spray dunnage washers clean parts by directing high-pressure, high-volume sprays to wash, rinse, and seal inhibit solutions against the parts as they are conveyed through spray chambers on a belt.

The belt washer floods the parts from above and below using an overlapping spray that completely and uniformly forces the solution into all the contours of the parts. The high spray pressure combined with the high volume of solutions delivered effectively removes oils, soils, dirt, chips and other by-

products associated with manufacturing and re-manufacturing.

Throttling valves will be installed for all top and bottom headers to minimize movement.

Vestibules (also called quiet zones) are located before and after each spray chamber to minimize over-spray and solution carry-over between tanks. The vestibules enable the wash or rinse solutions to drain back into their respective supply tanks and minimizes the potential for cross tank contamination.

## *Industry Leading Drying Capability*

With dunnage, drying is always the most difficult task. Our fully recirculating, high-volume, air flow dryer uses several slots to force hot air through and around parts from multiple directions. The high volume air flow around each part results in fast drying through evaporation. Unlike a blow-off design, which requires a continuously firing heat source, our recirculating design heats only on demand. Once the dryer reaches a uniform stable temperature, the heat source fires only when needed to maintain the desired temperature. Recirculating the heated air requires about 25 to 35 percent of the energy needed to operate a heated blow-off.



# MONORAIL SYSTEMS

Monorails are often used for surface treatment prior to painting or other similar applications. In a typical pre-paint cycle, the monorail moves the parts through a stainless steel housing with spray headers located on both sides, top and bottom. The parts are sprayed with aqueous iron phosphate solution, alkaline cleaner and rinse water pumped through nozzles, which are located to provide 100% coverage of all surfaces. After the iron phosphate spray, the parts are moved through a rinse followed by a second rinse and seal.

Surface treatment is not the only application, however. In other instances, difficult to clean parts with odd geometries can be designed on a circular or oval shaped track to create a closed loop alkaline cleaning system. Whatever the application may be, JRI/Jenfab has the right solution for your monorail application.

## ***Smart Water Management***

The wash stage will use the rinse stage water for make-up through a feed line from the rinse spray pump. This feed line will contain a solenoid controlled by operational liquid level float located in the wash tank. When the tank requires make-up water, the solenoid is energized open and the rinse spray pump pressure injects rinse water containing some of the previous tank's chemistry back into the wash tank. This system allows make-up water to be directed to the wash stage as a means of water and chemical conservation. Fresh water will only be added to the rinse stage during system operation for enhanced rinse water quality.



# DIP AGITATION TANKS

The Dip Agitation Tank (DAT) units use a combination of static and/or mechanical motions within a liquid bath or drying chamber to facilitate a specific process objective.

These units are easy-to-use and easily customized, which cuts lead times and increases turnaround. The mast height is also appropriately sized to fit into tight spaces.

Some of the options available for the DAT include filter systems, ultrasonics, spray under immersion with weir system and sparger, oil coalescer, skimming system, auto fill and low water shutoff among others.

The DAT system is also available in four

standard sizes as well as in 230, 208 and 460 volt three-phase or single-phase electric configurations. For customers outside the U.S., both 380 and 575 volt, three-phase, 60 cycle electric configurations are available.

Although DAT systems can serve any parts washing need requiring dip agitation, they are designed to easily accommodate the requirements of the aerospace, industrial and automotive industries. The DAT can also be used for surface treatment applications.

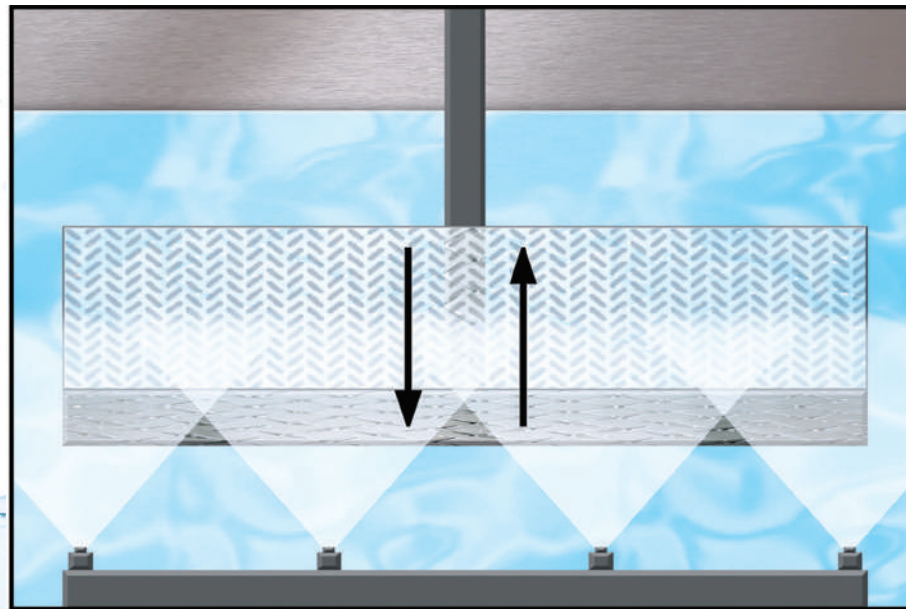
It is this versatility and dynamic function that allows JRI/JenFab to achieve superior results in washing, rinsing and drying.

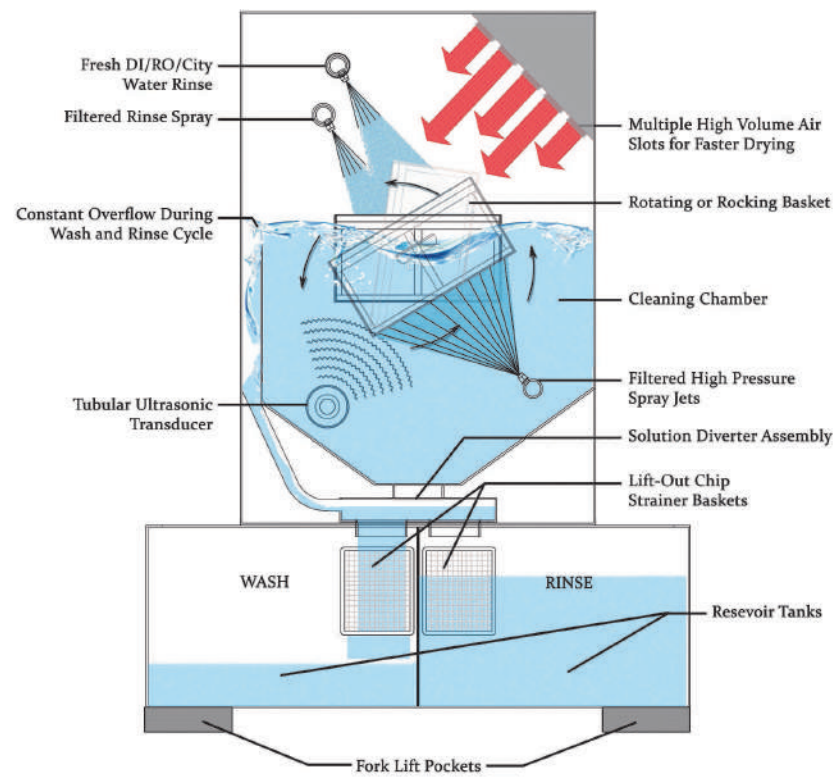


**STANDARD SIZES: 24"X12", 24"X 24", 36"X 25", 48"X 25"**

## **Spray Under Immersion Option**

*Spray under immersion works similar to hot tub jets. By moving the cleaning solution through the tank, higher levels of cleaning can be achieved.*





**\*Concept of operation**



# LEAN CLEAN 360 SERIES

**OPEN AIR SPRAY - SPRAY UNDER IMMERSION - ULTRASONIC CLEANING - REGENERATIVE HOT AIR DRYING**

The Lean Clean system's ability to submerge baskets while simultaneously rotating and spraying them with high-pressure, high-volume cleaning and rinsing solution separates it from other cleaning systems.

This turbulence results in the best possible cleaning of complex-shaped parts by penetrating blind holes and cavities. The delivery of high volumes of filtered solution purges the cleaning chamber more than twice per minute, flushing

soils and chips from the parts and process chamber, allowing even the most complex parts with blind holes to be effectively cleaned. Adding optional ultrasonics provides increased precision and cleaning effectiveness.

## Standard Features

The Lean Clean family comes with a number of standard features that would typically cost extra, including bag filters for the wash and rinse stages, a Programmable Logic Computer (PLC) and Human Machine Interface (HMI), ergonomic load height with a door locking mechanism, and solid stainless steel construction.

### SPECIFICATIONS

	360-1	360-2	360-4	360-8
<b>Work Envelope</b>	12" x 20" x 6" (One Basket)	26" x 21.5" x 8" (Two Baskets)	50" x 21.5" x 8" (Four Baskets)	50" x 24" x 18" (Eight Baskets)
<b>Cycles/HR:</b>				
- Kaydon-Style	8 Kaydon-style baskets (2.7 cu. ft/hr)	16 Kaydon-style baskets (5.4 cu. ft/hr)	32 Kaydon-style baskets (10.8 cu. ft/hr)	64 Kaydon-style baskets (21.6 cu. ft/hr)
- SS Jenfab Basket	8 SS Baskets (6 cu. ft/hr)	16 SS Baskets (15.5 cu. ft/hr)	32 SS Baskets (31 cu. ft/hr)	64 SS Baskets (62 cu. ft/hr)
<b>Tank &amp; Housing Material</b>	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel
<b>Tank Volume (Per Tank):</b>	75 Gallons	230 Gallons	375 Gallons	375 Gallons
<b>Pump Volume (Per Tank):</b>	60 GPM @ 40 PSIG	120 GPM @ 40 PSIG	180 GPM @ 40 PSIG	250 GPM @ 80 PSIG (Wash)/180 GPM @ 80 PSIG (Rinse)
<b>Solution Temperature:</b>	160°	160°	160°	160°
<b>Dryer Blower:</b>	1600 CFM @ 4" S.P. Recirculating	3000 CFM @ 4" S.P. Recirculating	6000 CFM @ 4" S.P. Recirculating	8000 CFM @ 4" S.P. Recirculating
<b>Dimensions:</b>	3' 4" x 6'	6' 9" x 7' 9"	10' 3" x 7' 9"	10' 3" x 7' 9"
<b>Sound Level:</b>	<75 DBA	<75 DBA	<75 DBA	<75 DBA

# HOIST SYSTEMS



## Ultimate Process Flexibility

*The programmed transporter offers the flexibility to vary immersion and drip times from tank to tank, which can be easily changed should there be a future alteration in process or chemistry.*

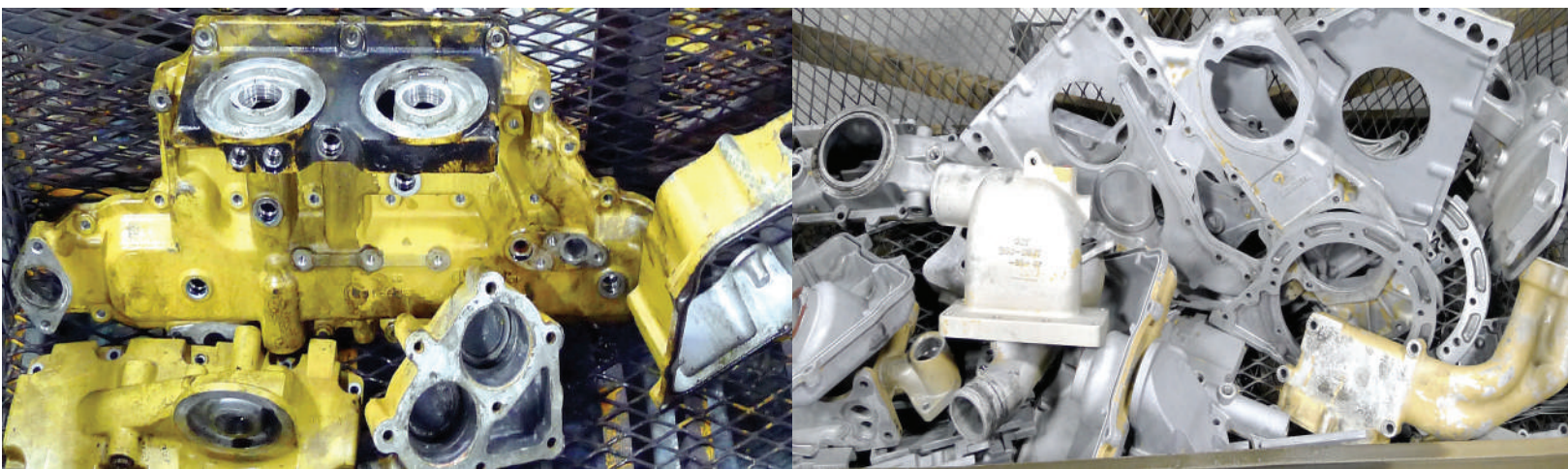
JRI/Jenfab hoist cleaning systems clean parts by submerging them in a series of heated wash and rinse tanks. Spray above solution and high pressure spray under immersion systems are available to enhance the cleaning and rinsing capabilities. A cantilevered, track-mounted hoist system automatically raises the parts into and out of the tanks. Optional ultrasonics are used in some tanks to increase the cleaning effectiveness of the solutions by setting up high-frequency cavitation.

Both the lateral and vertical motion of the transporter has acceleration and deceleration capability for rapid and smooth transfers. A proximity switch located at each station controls the lateral positioning of the transporter. The design offers accurate positioning of the load as well as positive

station identification. Lateral travel limits are protected by over-travel switches and mechanical stops at the track ends. High throughput applications requiring more than one transporter to service the line have additional safety switches that give crash protection between the transporters. The vertical motion has end of travel switches and a lift over-travel switch. A "belt slack switch" and a mechanical stop protect the lower limit.

A "tank occupied" switch is located at the bottom of the transporter. The "tank occupied" switch prevents the transporter from depositing a basket at a station already occupied.

The transporter and frame are ruggedly constructed of stainless steel and utilize sealed bearings and a polypropylene lifting strap for resistance to aggressive chemistry.



## ***AN INDUSTRY STANDARD FOR CONTINUOUS FLOW, HIGH-OUTPUT PRECISION CLEANING***

The Vertical Agitation movement produces a natural hydraulic flushing action, forcing solution between parts and through all recesses and cavities that may be on the part geometries. The machine can be programmed to agitate the baskets completely under water, or in and out of water, while occasionally raising the baskets out of the solution for draining, then totally immersing them again.

Rotation produces a hydrodynamic effect: blind-holed parts fill with solution during

rotation. Because of surface tension, this solution remains trapped inside the holes along with the oil and chips. The up-and-down agitation movement, when combined with rotation, breaks this surface tension, flushing the soils out of the holes.

The degree of vertical (up-and-down motion) agitation, vertical lift stroke, and vertical lift speed can be easily adjusted for each tank to match the cleaning action required for shallow or deep blind holes and cavities.

### ***Reduced Labor Costs***

*All machine functions can be fully automated and controlled by the Programmable Logic Computer (PLC). Once baskets are placed on the powered conveyor, they are continuously fed into the machine, mechanically positioned, automatically transferred through each process station, completely dried, and discharged. With optional material handling equipment, baskets can be returned to the load station or transferred to other locations.*

**VERTICAL AGITATION (VA) &  
VERTICAL AGITATION +  
ROTATION (VAR)**

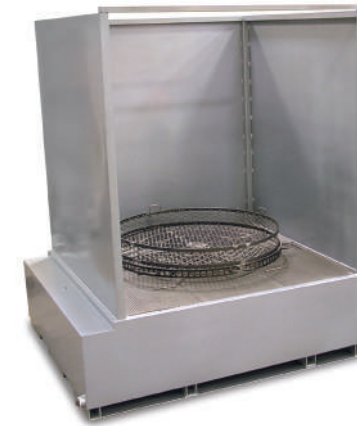
# CUSTOM SYSTEMS

At JRI/Jenfab, we understand that certain applications call for creative, out-of-the-box thinking. When this arises, we are happy to take on the task of developing a system that will work for your needs.

Whether this is developing a lower cost option, such as the Flex Cell or a wash booth, or cleaning complex parts with difficult geometries, we are eager to develop a solution that works best for you.



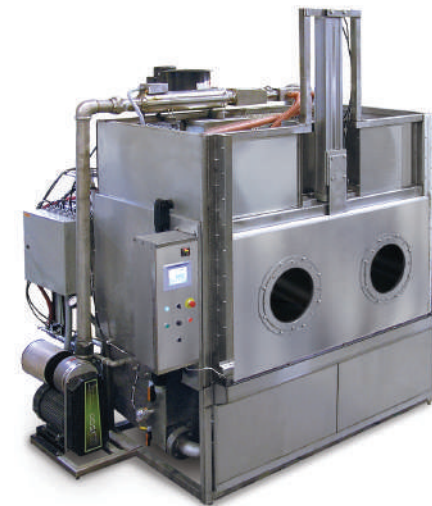
**FLEX CELL  
ROTATING BASKET**



**WASH BOOTHS**



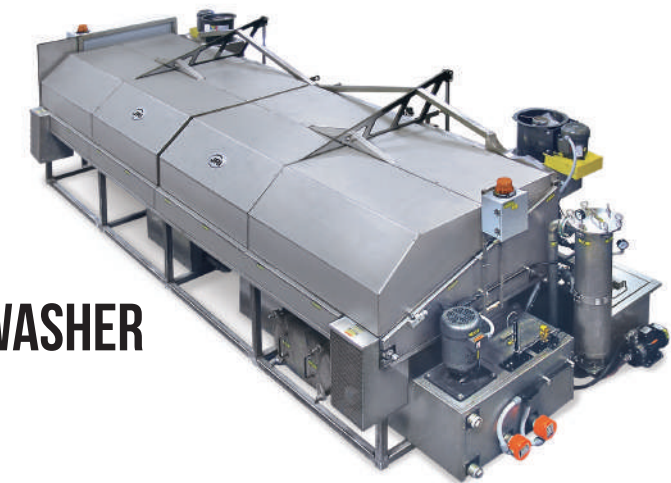
**ROLL WASHER**



**GLASSWARE WASHER**



**INDEXING  
WASHER**



**PIPE WASHER**



# LAB TESTING CAPABILITIES

JRI/Jenfab has the capability to test clean your parts in our lab located at our Connecticut facility. We can also do particle count analysis of the soils on your components both before and after test cleaning.

A report can be furnished to you with an exact particle count as well as the sizes of debris on your raw and Jenfab cleaned parts down to 10um (micron). Likewise, we

also have the ability to determine the total molecular weight of the soils on your parts both before and after we have processed and cleaned them.

There is no cost to you for this analysis or to process clean your components. This gives us the ability to document the cleaning capabilities of the proposed equipment and you the reassurance that we can achieve stringent cleaning requirements.

## ***Our Test Lab Has the Ability To:***

1. Perform a fully automated particle count and sizing for particles as small as 10 micron for soil analysis and to verify cleanliness achievement.
2. The ability to perform fiber detection and measurement, and have the capability to have a separate particle and fiber count.
3. Ability to differentiate between metallic and non-metallic contaminants.
4. Ability to measure the total molecular weight of the part soils and debris both before and after cleaning.
5. ISO compliant analysis and reporting.
6. The system incorporates a high resolution digital color camera for documentation along with a detailed report for quality control.
7. System documentation for certification of calibration for full traceability.





# MACHINE REBUILDS

Over time processes can change, leaving companies with a wash system that doesn't quite accomplish the required task any longer. Through our service department, we are able to make changes both in the field or by bringing a machine back to our facility.

This can range from small fixes like changing from bag to cartridge filters or much larger alterations, such as adding additional tanks to most existing hoist systems. No matter the changes, we are here to work with you.

This dedication to service does not only apply to machines that we have fabricated in the past. When the opportunity presents itself, we are happy to apply our industry knowledge to obsolete wash systems for which service is no longer available.

For example, if you have an old rotary drum system built by a company that is no longer in business but need a replacement drum after experiencing damage, we can reverse engineer your existing system and supply the drum needed.

# SERVICE CAPABILITIES

Our goal is for your system to run flawlessly over the life of the equipment. That's why we offer two service plans to cover your maintenance needs. Call us today and let our experienced technicians keep your parts washer operating at peak efficiency.

## Machine Startup Plan

Avoid downtime and make sure your new parts washer is ready to go on day one by taking advantage of JRI/Jenfab's Machine Startup Plan. With this service, JRI/Jenfab technicians will visit you on-site to inspect and test your parts washer after installation. This is especially useful if you have a large or complicated install and ensures there are no hidden problems that may cause your parts washer not to function properly.

This service includes:

- A one day, on-site visit from JRI/Jenfab
- Machine inspection
- Installation verification
- A test run of the machine
- Training for end user's personnel (maintenance and operation)
- A test and service report

Pricing varies.

## Scheduled Maintenance Plan

Your parts washer is a big investment. Get the most out of it by making sure you have it serviced at least once every year. Parts washers that do not get serviced don't last as long and operate less efficiently over time.

That's why JRI/Jenfab offers a complete maintenance plan to keep your parts washer operating at peak performance.

This service includes:

- An on-site visit from JRI/Jenfab
- Testing and inspection of the machine
- A test run and adjustment of machine settings
- Pumps, heaters, turntable drives, level sensors, electrical system, filters, strainers, skimmers, exhaust systems, lubrication points, nozzle, and piping inspection
- Additional training for end user's personnel (maintenance and operation)
- A test and service report

This service may be purchased and scheduled up to twice per year. Pricing varies.



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