fives

SMART AUTOMATION SOLUTIONS

AUTOMATION

FIVES INDUSTRIAL WASHERS

Comprehensive Solutions for Industrial Cleaning & Surface Finishing

Fives Industrial Washers

Full-line of innovative Part Washing, Drying, and Surface Cleaning Technologies for the Automotive Industry

Fives Cinetic Corp. offers a full line of machinery for industrial parts cleaning and surface treatment applications. Our industry leading solutions have served automotive powertrain companies across the globe in achieving necessary cleanliness requirements—meeting a desired level of precision, and following proven processes that increase efficiencies and build on sustainability.

Solutions to Target Any Cleaning Requirements

Our team will partner with you to identify the optimum cleaning technology to achieve your cleanliness requirements — whether that is a standard offering or a custom built (engineered to order) solution.

90 Years of Industrial Cleaning Know How

A legacy spanning over 9 decades of producing industry leading self-contained, rugged part washers, has enabled us to continuously develop and deliver innovative technologies, renowned for quality, performance, reliability and efficiency.

Single Source, Global Service Network

Fives' global precence grants you access to our regionally situated sales and service teams to support your on-site installations and maintainence supporting powertrain and drivetrain component production. We have service sites in: USA, France, Mexico, Canada, and Asia.

Proven Processes and Technologies

Our comprehensive range of industrial cleaning technologies provides solutions for virtually all cleaning requirements.

The complexity of a component, the nature of its contamination, and the level of precision cleaning required for the application, will determine the optimal cleaning equipment and process needed. Our team will work with you to develop the right solution for your specific applications.

STANDARD PROCESSES

- Spray cleaning
- Immersion cleaning
- Ultrasonic cleaning
- Injection flood washing
- Vacuum drying
- Deburring
- Precision cleaning
- Surface processing

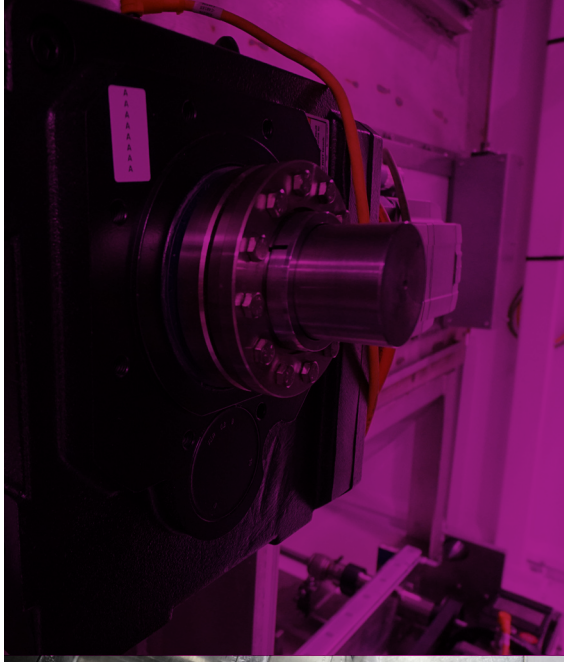
	CNC WASHER	CRANKSHAFT WASHER	ROBOTIC WASHER	TUNNEL WASHER	CMM WASHER	VACUUM DRY STATION
Main Functionality	Wash and dry (High pressure washing, deburring and brush deburring)	Wash and dry	Pre-wash, high pressure wash, pressurized dry, and low pressure dry	Wash, rinse and dry	Flush and semi-dry	Final dry
Category of Workpiece	Prismatic	Cylindrical	Prismatic	Small Cylindrical & Prismatic	Cylindrical & Prismatic	Cylindrical & Prismatic
Precision Level Required	High	High	High	Low - Ideal for uncomplicated geometries	Low - Ideal for uncomplicated geometries	----

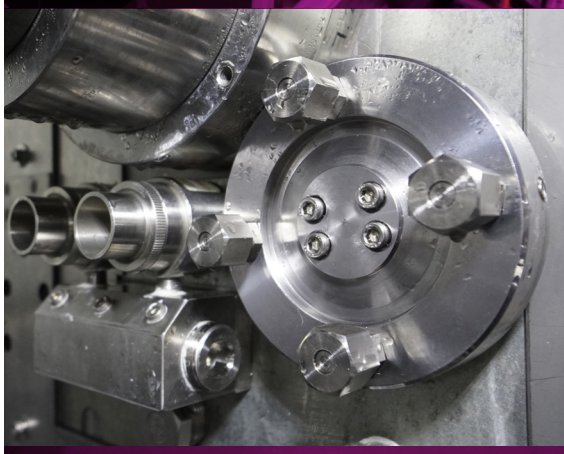
In-House Clean Test Laboratory

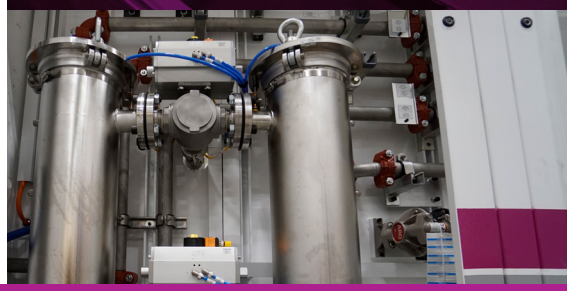
We offer comprehensive cleanliness analysis for all customer applications. Our in-house clean laboratory is equipped with state-of-the-art test equipment to enable our experts to prove out your most critical cleaning requirements.

Project Management

When you work with Fives you will have a dedicated project manager, allowing you a single point of contact from the start of the design phase to installation and throughout the product's lifecycle.







SmartWash

5-axis Numerically Controlled Parts Washing System

Prismatic Parts | High Precision | Wash, Dry & Debur

High-Precision Wash and Dry for Cylindrical Parts

The SmartWash 5-axis NC industrial parts washer is the only flexible washer of its kind. It is designed to clean, deburr and dry almost any prismatic part with complex geometries.

This compact and versatile machine effectively tackles an endless variety of part cleaning applications that previously required separate processes and machines to handle general washing, lancing, seal and flushing, high-pressure washing, high-pressure deburring and brush deburring functions.

MAIN APPLICATIONS

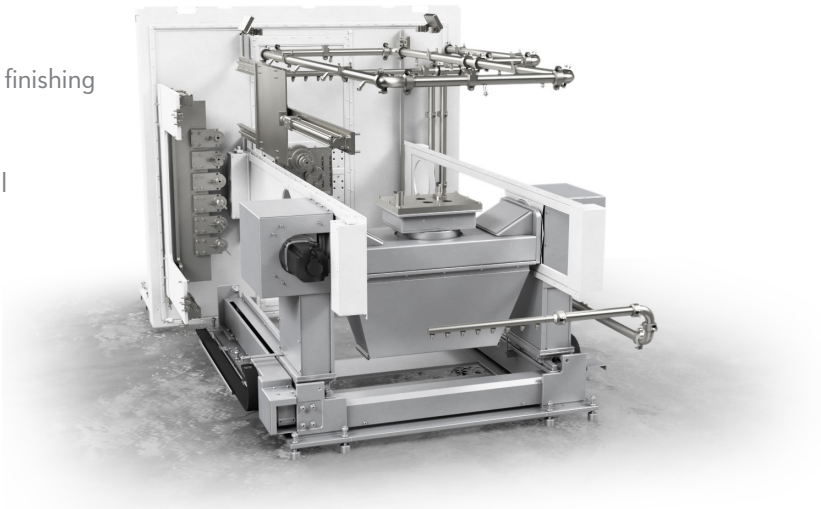
- Gear Box Housing
- Injection Pump Body
- Cylinder Blocks
- Oil Pump Housing
- Timing Gear Cover
- Water Pump Housing
- Automatic Transmission Housing
- Brake Caliper
- Clutch Housing
- Connecting Rod
- Cylinder Block
- Cylinder Head
- EV Housing
- Valve Body

SYSTEM ADVANTAGES

- 5-axis manipulation
- Non-complex programming via NC controller
- Processes prismatic parts with complex geometries
- Unlimited tooling combinations via automated tool-changer
- Supports high quality part production with combined surface finishing
- Small footprint, saving on valuable facility space
- Standardized shipping, minimizing equipment delivery costs
- Suitable for a variety of production rates, offering incremental investment options.

PROCESS CAPABILITY

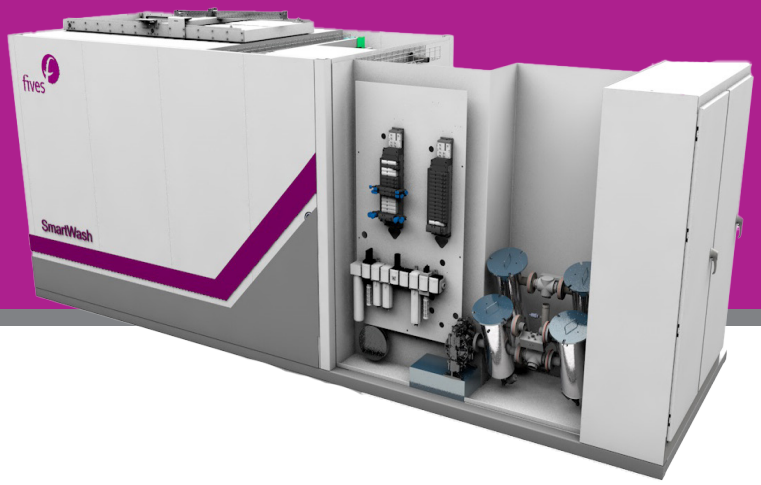
- General Washing
- Lancing
- Seal & Flushing
- High Pressure Washing
- High Pressure Deburring
- Brush Deburring



5-AXIS FLEXIBILITY & AUTOMATED TOOL-CHANGING

SmartWash delivers paramount flexibility via an automated tool-changing system. This enables the machine to seamlessly alternate between an endless variety of surface finishing tools – rendering this machine universal to prismatic applications. Its patented toolholder is rated for pressures up to 8,000 PSI (551 bar) and supports up to 7 interchangeable tools at once.

This numerically controlled washer has a total of 5 axes. A single part is manipulated along 3 of these 5 axes, exposing it to cleaning media in optimum positions for both cleaning and drying. The tool spindle itself is manipulated along the other two axes, allowing rapid movement around the part. What's more, the 5 axes that make the SmartWash comparable to the flexibility of a conventional robot washer, are located outside of the harsh environment of the heated, caustic, aqueous spray. This allows for a more robust machine, with less waste, less down time, and ultimately cleaner parts.



Industry Leading Technology for Drivetrain and Powertrain Components

OPERATOR-FRIENDLY & RELIABLE NC-BASED PLATFORM

The SmartWash is easily programmable via a NC controller that can be continuously redeployed to support a variety of new processes and parts, both domestically and internationally. It utilizes servos and variable frequency drives for all motors, and all the components are UL (Underwriters Laboratories) and CE (Conformité Européenne) approved for use around the world.

Beyond the operator-friendliness of a programmable platform, the NC controller and its sensors, meters and software facilitate its ability to run self-diagnostic tests. This alerts the customer to possible issues, such as flow restriction or motor vibrations that may impede optimum functionality.

Technical Specifications	
Maximum Permissible Loading Weight	136 kg
Maximum Part Size	635 mm wide x 635 mm long x 407 mm tall
A Axis Swivel Angle	-180°/+180°
B Axis Rotate Angle	-180°/+180°
Machine Size	2235 mm wide x 6604 mm long x 2480 mm tall
Gantry / Robot Access Opening Size	914mm x 914 mm
Maxiumum Machine Sound Level (TWA)	77 dBA
Pump Output	238 lpm
Pump Pressure	19 bar
Filtration Flow Rate	5 lpm per sq. meter
Dirty Tank Reservoir	568 liters
Blow-Off Air Output	1530 m^3/m
Blow-Off Air Pressure	200 mbar
Connection to Customer Supplied Exhaust System	200 mm Flange Connection
Medium Pressure Pump Output	238 lpm at 19 bar
High Pressure Pump Output	34 lpm at 600 bar

REQUIRED SELECTIONS

- Tooling for components and surface finishing
- Low pressure straight and V-jet nozzles
- High/Medium and low pressure (90° nozzles)
- High/Medium and low pressure lances
- High/medium pressure mole jets
- Low pressure probes
- Seal and flush
- Bottle brush
- Blow-off nozzle

HIGH-PERFORMANCE FEATURES FOR OPERATIONAL EFFICIENCY

The SmartWash offers optional features for enhanced performance such as high-pressure deburring, brush deburring, or a rotor jet for wider surface pressure cleaning.

With the IIoT option enabled, SmartWash can deliver real-time performance tracking and predictive data through digitally-connected dashboards designed to forecast maintenance cycles, troubleshoot and offer insights to enhance operational efficiencies. This digital intelligence lets your facility work smarter, not harder.

OPTIONAL ENHANCED PERFORMANCE

- High-pressure washing, deburring and brush deburring
- 350 Bar pump for high pressure cleaning
- 100 Bar pump for medium pressure cleaning
- Rotor jet for high-pressure cleaning of wider surfaces
- Oil recovery unit, removing oil contained in cleaning solution
- Chemical feeder
- Exhaust system
- Additional filtration - vacuum
- Camera system
- Worn or damaged tool and fixture and sealing detection
- Industry 4.0 capable

RotaryPartWash

Rotary Shaft
Parts Washing System

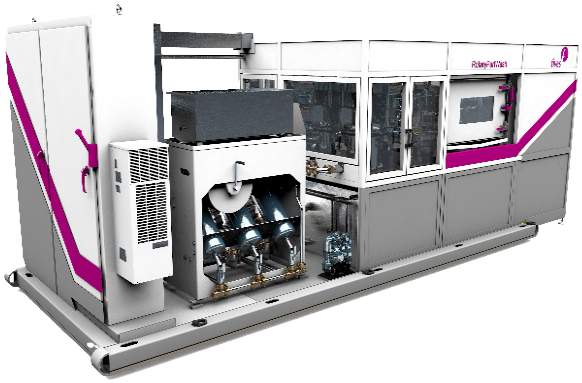
Cylindrical Parts | High Precision | Wash & Dry

HIGH-PRECISION CLEANING FOR CYLINDRICAL PARTS

The RotaryPartWash industrial parts washer was designed for high-volume, high-precision cleaning of cylindrical powertrain components such as crankshafts, camshafts, axle shafts and spline shafts. All cleaning and drying is encapsulated within a single chamber, that allows for constant visual access.

Our system deploys a highly filtered, aqueous-based spray at elevated pressures of up to 250 PSI (17 bar). This targeted spray cleans the entire workpiece, removing chips, oil and swarf from external geometries, cross holes, deep holes, tap holes and more. The workpiece is secured by a spindle and manipulated radially by a rotary shaft. This allows it to repetitively impinge and drain throughout the entire wash cycle.

Its nozzles are securely fixed in place to prevent any accidental repositioning, and are accessible from outside of the chamber to promotes easy access for maintenance. The drying process utilizes high-pressure air, shearing moisture away from the part to deliver a completely dry and spotless product that is ready for assembly.



Specifications	
Dimensions (Max)	150mm x 150mm x 600mm
Noise Level	<77 dB (A)

STRATEGICALLY ROUNDED SURFACES & VISUAL ACCESS PANELS

RotaryPartWash supports high-volume production during in-process and final assembly stages. Single cylindrical parts are top loaded into the chamber using a gantry crane. A transparent safety glass window enables continuous visual checks and easy maintenance access to the parts being washed as well as the machine's supporting mechanics.

The chamber's envelope has strategically rounded surfaces, which allow water to roll off the side walls and into an integrated drip pan. This eliminates the possibility of water dripping directly onto the part and leads to a cleaner and drier part following the wash cycle.

COMPACT, MODULAR CONFIGURATIONS TO ACCOMMODATE INCREASED PRODUCTION

RotaryPartWash was designed to perform all cleaning and drying within a single chamber measuring 150 x 150 x 600 mm (5.9 x 5.9 x 23.6 in). It can be externally rotated and adjusted using a programmable logic controller (PLC)-based control panel. This compact and efficient design offers a small footprint, leaving valuable floor space to scale alongside production demands.

Modular by design, RotaryPartWash can be set up as a single or dual chamber configuration to meet any facility's volume requirements. When outfitted with dual chambers, the stations run independently of each other, enabling continuous operations.

RoboWash

6-axis Robotically Manipulated Parts Washing System

Prismatic Parts | High Precision | High Pressure Wash & Dry

HIGH-PRECISION WASHING FOR COMPLEX PRISMATIC PARTS

RoboWash is a robotic industrial washer featuring a fully automated parts manipulation process for high-precision cleaning of prismatic applications during the final assembly and in-process stages of production.

The RoboWash is built for cleaning parts with complex geometries, such as engine blocks, cylinder heads and transmission cases. It incorporates pre-wash, high-pressure wash, pressurized dry and low-pressure dry processes, all in one versatile machine. High-pressure deburring is also included as a standard feature.

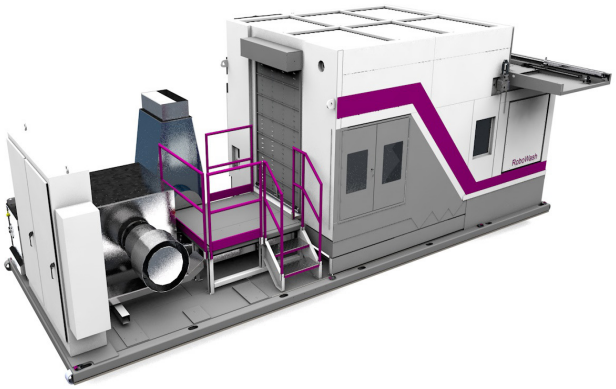
RoboWash is fitted with both fixed and spinning nozzles to deep clean cross holes, deep holes, tap holes, bore holes, back tapers and cavities. An aqueous-based targeted spray clears out contamination from burrs, chips, oil and swarf. Separate chambers accommodate various stages of the industrial cleaning process, and movements between chambers can be made via robot.

PATENTED REMOVABLE 6-AXIS ROBOT

Despite the presence of complex parts, the RoboWash makes adjustments to part orientation simple and easily accessible. Its 6-axis robot enables limitless manipulation of parts, to expose all external surfaces for high-precision cleaning and drying.

The standout feature of the RoboWash is the patented removable robot. While most competing robotic washers require a partial disassembly of the machine to access a robotic arm and perform maintenance. The RoboWash offers simple, isolated removal of its 6-axis robot — eliminating significant downtime and associated maintenance costs. What's more, the RoboWash is capable to integrate any robot platform that supports severe-duty wet environments.

Technical Specifications	
Maximum Robot Payload	235 kg
Maximum Part Size	635 mm wide x 760 mm long x 635 mm tall
Machine Size	3353 mm wide x 9028 mm long x 3352 mm tall
3 Stations	Medium Pressure Wash / High Pressure Wash / Dry
Gantry / Robot Access Opening	914 mm x 914 mm
Maximum Sound Level	77 dBA TWA
HP Pump Output	34 lpm @ 600 bar
Medium Pressure Pump Output	238 lpm at 19 bar
Maintenance Videos Available	Yes
Blow-Off Air Output	1530 m^3/hr
Blow-Off Air Pressure	200 mbar



GLOBALLY ADAPTABLE AND READY TO REDEPLOY

RoboWash can be easily reprogrammed and redeployed to take on an endless variety of cleaning applications. Its skid-mounted base enables it to be conveniently transported throughout a plant or facility.

Adaptable for global use, its motors use servos and variable frequency drives to ensure worldwide voltage compatibility. The universal nature of the RoboWash eliminates the need to continuously purchase new capital equipment, meaning significant cost savings during part changeovers and transitions to other machining lines.

TunnelWash

Linear Conveyorized Parts Washing System

Small Cylindrical & Prismatic | Low Precision | Wash, Rinse & Dry

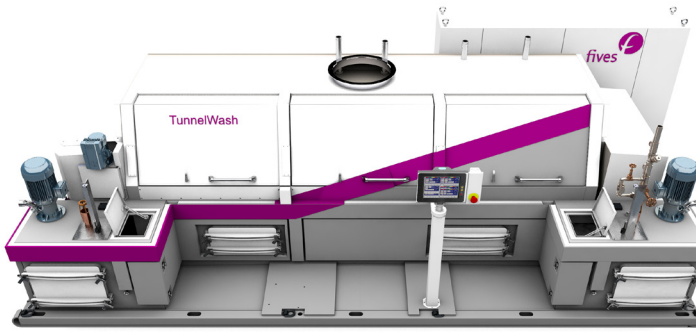
HIGH-SPEED, CONVEYORIZED BATCH CLEANING

The TunnelWash is a modular, multi-stage, linear conveyorized parts washing system. It is designed as the economical and high-speed solution to support batch cleaning of small parts with uncomplicated geometries, such as gears and small shafts.

With shorter cycle times and higher throughput yields, this tunnel washer is best suited to perform general cleaning and drying of high-volume prismatic and cylindrical parts up to 610 x 250 mm (24 x 9.8 in).
The TunnelWash delivers solvent-free, continuous cleaning efficiency via an in-line conveyorized operation. Parts to be cleaned are delivered to the washer either manually or via conveyor belt. Parts being transported through the system, can either sit freely on the conveyor, or be carried as a group of small parts via a wire basket.

Once loaded, the parts are driven through a linear tunnel. They pass under a series of strategically placed nozzles that deliver a low-pressure aqueous-based spray (up to 87 PSI/6 bar), until they reach the blow-off station where any residual water is cleared away.

Technical Specifications	
Maximum Part Size	610 mm wide x 250 mm tall
Machine Size	2235 mm wide x 9650 mm long x 1840 mm tall
Stages	Wash/ Rinse/ Dry
Maximum Sound Level	77 dBA TWA
Wash Pump Output	567 lpm @ 5.2 bar
Rinse Pump Output	283 lpm @ 3.5 bar



MODULAR CONFIGURATIONS TO SUPPORT ANY PRODUCTION LINE

The TunnelWash is a compact, highly flexible, modular solution for cost-efficient high-volume production cleaning in a single, configurable machine.

The washer's modular design can expand to support up to four consecutive treatment zones: wash, rinse, secondary rinse, blow-off. It can also outfit up to four conveyor-driven lanes to simultaneously process a variety of small component types.

Its standard configuration utilizes belt conveyor or dual-strand chain conveyor systems. Custom configurations are also available to support overhead conveyor, bound pallet chain conveyor, free roller and monorail systems. This versatility, along with programmable cycle times, fixed and variable conveyor speeds, and indexing conveyor drives offer production rate flexibility that would otherwise require multiple machines and more floorspace.

PROVEN TECHNOLOGY TRUSTED BY THE AUTOMOTIVE INDUSTRY

With hundreds of units sold and commissioned, TunnelWash is the proven batch cleaning technology of large automotive suppliers and OEMs around the world. Our 90-year brand legacy has a reputation for quality and reliability, built from a foundation of trust from our customers.

InspectionWash

Front-loaded
Parts Washing System

Cylindrical & Prismatic | Low Precision | Flush & Semi-Dry

EFFICIENT CLEANING FOR ACCURATE AUDIT REPORTING

The InspectionWash is a front-loaded cabinet washer designed for the essential clean and dry of powertrain components that have been randomly selected for Coordinate Measuring Machine (CMM) inspection. The washer performs a flush and semi-dry of the part's external surfaces – preparing cylindrical and prismatic components for accurate auditing.

Throughout the production process, parts are chosen at random to be inspected by the CMM lab for quality control. Each selected part requires a quick, low-precision clean of external surfaces before being sent to the lab for quality checks. Without an essential clean, the parts could contain contaminants that are likely to skew measurements and result in inaccurate auditing.

The InspectionWash provides an efficient flush and semi-dry to appropriately prepare the part's external surfaces for inspection. The parts are readied with speed and efficiency, as all washing and drying takes place in a single chamber.

Technical Specifications		
	CMM48	**CMM60**
Maximum Part Size	550 mm wide x 550 mm long x 800 mm tall	700 mm wide x 700 mm long x 1200 mm tall
Machine Size	1470 mm wide x 1960 mm long x 1900 mm tall	2000 mm wide x 2280 mm long x 2720 mm tall
Stages	Wash / Dry	Wash / Dry
Maximum Sound Level	77 dBA TWA	77 dB TWA
Wash Pump Output	567 lpm @ 3.5 bar	757 lpm @ 4.9 bar

LOW-PRESSURE WASH FOR CYLINDRICAL AND PRISMATIC PARTS

InspectionWash conducts both single part and batch cleaning for a wide variety of automotive powertrain components. Its front-loaded chamber features large swing-out doors and a slide-out rotary table for full and easy access to load parts manually or by crane. As the InspectionWash's turntable rotates, fixed spray nozzles address contaminants such as chips, oil and swarf, at pressures up to 87 PSI (6 bar).

TWO TURNTABLE CONFIGURATIONS

InspectionWash offers two different machine configurations based on the required table diameter. The 152 cm (60 in) turntable configuration is designed for larger parts up to 700 x 700 x 1200 mm (27.6 x 27.6 x 47.2 in) such as transmissions and cylindrical blocks and heads. The 122 cm (48 in) turntable configuration is designed for crankshafts, camshafts and other small parts up to 550 x 550 x 800 mm (21.7 x 21.7 x 31.5 in). Both options are designed to meet the needs of the automotive, ærospace and other quality-driven industries

ChamberDry

Vacuum Chamber Parts Drying Station

Cylindrical & Prismatic Parts | Final Dry

FOR RIGOROUS DRYING REQUIREMENTS

The ChamberDry vacuum dry station, was designed to act as a secondary measure in achieving a comprehensively dry part. The ChamberDry is ideal system to support production parts that unintentionally retain high residual moisture following the industrial washing process.

Residual moisture can occur when a customer's cycle time specifications are so short that the industrial washer is physically unable to produce a completely dry part during the initial drying cycle. Parts with complicated geometries are also notorious for holding onto moisture because of complex cavities that can prove harder to reach. That is when the ChamberDry steps in.

Using a powerful vacuum pump, the air is drawn out from inside the chamber. Without the presence of air or atmosphere, the ChamberDry creates a unique environment in which water can boil at very low temperatures—causing any remaining moisture to evaporate. This method of low-temperature drying, prevents any part deformities that can occur in extreme-heat conditions, while also guaranteeing a completely dry component that is clear of contaminants and prepped for production assembly.

Technical Specifications	
Maximum Part Size	635 mm wide x 635 mm long x 407 mm tall
Machine Size	1080 mm wide x 3330 mm long x 2470 mm tall
Stages	Wash/ Rinse/ Dry
Maximum Sound Level	77 dBA TWA
Nominal Pump Displacement	420 m^3/hr
Ultimate Pump Pressure	<0.05 mbar

ROBUST VACUUM CHAMBER WITH VISUAL ACCESS

The ChamberDry is engineered with a clear, pneumatically actuated acrylic chamber. Parts can be top loaded via gantry or robot. The chamber's unique circular shape provides further robustness to withstand a great deal of vacuum pressure. The functional and transparent panel design allows for constant visual checks and easy maintenance access.

The ChamberDry can be customized to meet any facility's high-volume production needs. With available customization options as simple as adding a second vacuum pump, to designing a completely custom flow-through chamber configuration, integrating smart diagnostics, or other sophisticated preventative maintenance systems.

FINAL DRY FOR CYLINDRICAL AND PRISMATIC PARTS

The ChamberDry can process cylindrical and prismatic high-production parts that support both in-process and final assembly stages for the automotive, ærospace, medical and wind turbine industries — any facility where high precision drying is required.

The ChamberDry efficiently complements our entire line-up of industrial washers. Contact us to learn more about their synergetic relationship and how this key secondary drying system will lend efficiency and quality to all stages of the precision cleaning process at your facility.

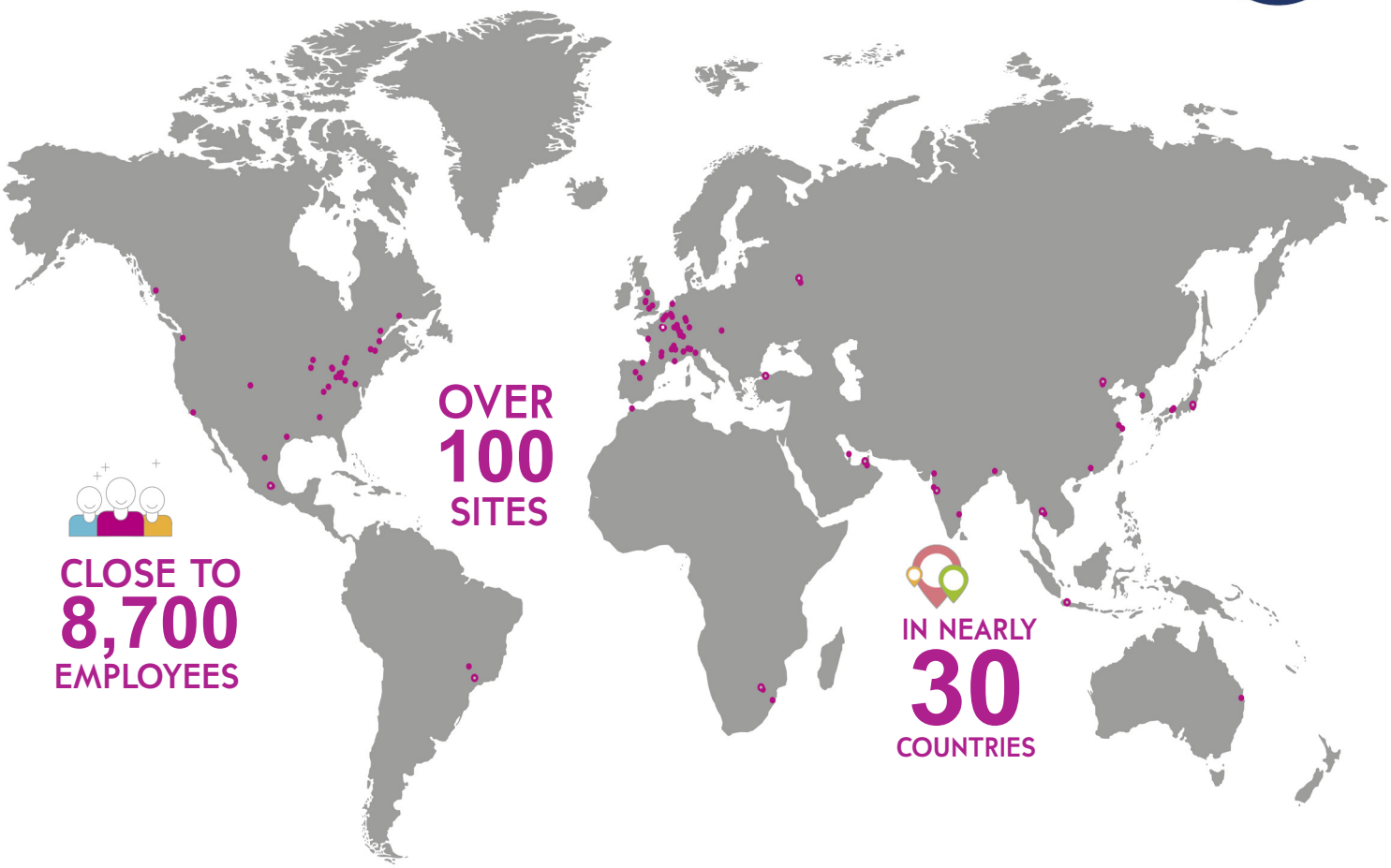
Fives Global Network and Solutions

Innovating towards the factory of the future

Teams located worldwide
with expertise in international project management

Fives designs and supplies machines, process equipment and production lines for the world's largest industrial players.

Fives supports its customers throughout the entire lifecycle of their equipment, from commissioning to revamping. This includes design, supply, installation, service and maintenance.



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