

PRODUCT MANUAL

Vol. 15,
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Clean Easy



Seal Easy

Contamination Control Systems
Hose, Tube, Pipe Cleaning & Sealing • Air Purification

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A word about Ultra Clean Technologies and our products...

When you choose Ultra Clean Technologies to control your fluid power contamination, you can be sure that your company is choosing the world's most technologically advanced and comprehensive contamination control solutions, and dealing with some of the most highly knowledgeable sales and customer service representatives in the industry.

Our Products

Our flagship product, the *Ultra Clean System*, offers advanced cleaning over traditional flushing and other methods for ridding contaminants from hose, tube and pipe assemblies. The Ultra Clean System utilizes either a Hand-Held Launcher or Bench Mount Launcher to shoot Ultra Clean projectiles through hose, tube or pipe assemblies, ensuring contaminants are thoroughly dispelled. Building on our core product, we offer *Clean Seal System*, which uses a proprietary heat shrink technology with our Clean Seal Capsules to securely seal the ends of cleaned hose and tube assemblies, providing a superior alternative to traditional caps and plugs. To help eliminate contamination and oil spills when removing SAE flanged hose and tube assemblies, we developed the *Clean Seal Flange*. The Clean Seal Flange provides a quick seal over the SAE flange when components are being removed or switched out, keeping the oil in the hose or tube, and harmful contaminants out. This manual provides detailed information on these systems and associated products and parts.

Demand-driven R&D has inspired us to create these and more innovative new products, providing targeted solutions to industry-specific challenges. Our engineering team has a well-rounded and extensive understanding of hydraulics that enables us to work closely with the industries we serve, while also considering wider-use applications of our products for all industries that require contamination-free hoses and tubes in order to prevent costly equipment downtime or failure. Our products meet - and almost always exceed - ISO standards for hydraulic oil cleanliness, and are independently tested to determine the level of cleanliness to which hoses or tubes are actually cleaned.

Ultra Clean Technologies' hose and tube systems as well as breathers are manufactured and assembled in the U.S.A. All Ultra Clean Technologies products have a one-year Manufacturer's Warranty. The durability of our products eliminates the need to return an Ultra Clean Technologies product for in-warranty repairs.

Training & Education

In addition to our products, Ultra Clean Technologies provides comprehensive training and education both on Contamination (what it is, where it comes from, and how it damages fluid power systems), and Contamination Control using Ultra Clean Technologies products. We provide on-site training on the use of all our systems, and will "train the trainer," or an entire team, depending on the customer's desire. Further, we certify end users, OEMs or distributors who complete the Ultra Clean Technologies webinar on Contamination Control and Clean Hydraulic Hose Assembly Procedures. Participants can also request a co-branded impact movie on contamination control.

Service Excellence

Highly experienced in the Hose and Tube Cleaning industry, Ultra Clean Technologies' Customer Service team give you immediate and direct access to expert solution providers. Every salesperson has earned the Milwaukee School of Engineering's *Certificate of Contamination Control*. We share our expertise in product applications and performance over the phone and in the field.

Shipping & Warehousing

To enhance our reputation for service excellence, Ultra Clean Technologies has an established global distribution network - including international distribution points in Canada, South America, Europe, China and Brazil. For our customers, this means shorter lead times and minimized shipping costs. We keep a fully stocked warehouse with same day shipping for our North American and South American customers. European customers can count on our warehouse in The Netherlands for quick order fulfillment.

Thank you for choosing Ultra Clean Technologies!

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CLEAN EASY

Hose, Tube & Pipe Cleaning Systems



Ultra Clean Technologies offers a fast, less invasive way to clean contaminated hydraulic lines by shooting a projectile through the hose or tube assembly with a pneumatic launcher. The Ultra Clean Projectile strips out internal contamination, removing dirt, gunk and oil. Now your clean oil will stay clean as it reaches expensive components, preventing failure and system downtime.

An array of products in the **Ultra Clean System** line includes:

Hand Held Launchers & Kits

Bench Mount Launcher

AutoLoader™

Projectile Verification System

Nozzles & Adapter Rings

Variety of Projectile Types

Clean Easy with Ultra Clean!

ISO 13/10 cleanliness levels are achievable.

Applications for Hose, Tube & Pipe Cleaning Systems



Serving the Construction, Mining, Marine, Off-Shore, Hose and Tube Assembly markets, and many others....

Hydraulics	Removes rubber dust and metal particles from the cutting process on hydraulic hose. Removes metal flash from the crimping process on hose and tubes. Removal of contaminated oil from hoses, tubes and pipes in hydraulic systems. (Use the Ultra Clean System to reduce downtime, extend filter life and reduce the risk of failure and premature wear due to CONTAMINATION!)
Pneumatics	Eliminates rubber contamination, metal particles, contaminated oil and moisture that causes breakdowns and inefficiency.
Heat Exchangers & Condensers	Eliminates contamination that reduces heat transfer resulting in low level performance.
Steam Boilers	Removes most scaling in steam pipes for maintenance servicing.
Air Conditioning & Refrigeration	Eliminates minute particles in copper tubes and coolant lines that affect system performance.
Oxygen & Gas	Eliminates oil, grease and other contaminants from copper or S/S tubing.
Oil, Gas & Chemical Processing	Efficient cleaning of product pipes as part of service maintenance.
Earthmoving Equipment Maintenance	Reduction in flushing time and filter usage.
Automotive & Servicing	Cleaning of fuel lines and brake lines prior to assembly and servicing of components.
Food & Beverage Product Recovery	Retrieval of product from lines. Reducing or eliminating solvents or detergents.
Gun Barrels	To remove rust, scale or powder residue much faster than brushing or swabbing.

Specific information regarding the above applications is available upon request.

Recommended Cleaning Procedures

Hose

When hydraulic hose is cut with saws that use metal blades or abrasive wheels a tremendous amount of heat is generated. The heat causes the rubber dust and metal particle contaminants to stick to the hose tube as they cool. It is vitally important to clean the hose immediately after the cutting process before the contaminants cool and stick to achieve the best results. An Ultra Clean projectile should be fired through the hose prior to the installation of end connections. Fire one projectile in each direction through the length of the hose. This will allow cleaning in the areas occupied by the insertion of the hose nozzle at either end during the cleaning process. After the crimping or swaging of fittings, an Ultra Clean projectile should be fired through the entire hose assembly. This projectile will remove the metal flash from the crimping or swaging process. It is vitally important to seal the end fittings immediately following the last projectile to avoid re-contamination. Apply Clean Seal Capsules to the hose ends to keep airborne contaminants from entering the hose while protecting the threads.

Hydraulic Hose - Internal/External Skive

When hydraulic hose is cut with saws that use metal blades or abrasive wheels a tremendous amount of heat is generated. The heat causes the rubber dust and metal particles to stick to the hose tube as they cool. It is vitally important to clean the hose immediately after the cutting process to prevent this, and achieve best results. Two (UC) Ultra Clean projectiles should be fired in each direction through the hose before the internal or external skiving operation. If a mandrel is inserted into the ID of the hoses tube for skiving purposes the mandrel should be clean and mandrel lubricants must be clean and contamination free. It may be necessary to fire one or two UC or Tube Style Projectiles through the hose after the internal skiving process to remove rubber particles and lubricants. A custom Hose Nozzle that would occupy the skived area may be necessary to achieve a higher level of cleanliness. After the crimping or swaging of fittings, a (UC) Ultra Clean Projectile should be fired through the entire hose assembly. The UC Projectile will remove the metal flash from the crimping or swaging process. It is also vitally important to seal the end fittings immediately following the last projectile. Apply Clean Seal Capsules to the hose ends which will keep airborne contaminants from entering the hose while protecting the threads.

Used Hose & Tube Assemblies

Hydraulic hose and tube assemblies from systems that have experienced a failure need to have all of the contaminated oil removed. Disconnect each end of the assembly and secure one end into the Projectile Catcher (UC-PC). Fire air into the assembly without a projectile for several seconds to remove the excess contaminated hydraulic fluid. Fire 3 to 4 Ultra Clean Projectiles through assembly to remove contamination. Visibly check the last projectile for contamination. Repeat process until projectile has no signs of rubber or metallic particles on it. If the projectiles continue to show rubber particles the hose may need to be replaced. This is usually a sign of a rubber tube that is failing.

Tube

When tubing requires cutting, the ends should be thoroughly deburred prior to the use of the cleaning system. A tube nozzle and two Ultra Clean projectiles may then be implemented to clean the tube. If the tube appears to contain rust, weld slag or other corrosion on the inside surface, then an abrasive projectile should be used first, as many times as is necessary to remove the corrosion. Follow by using an Ultra Clean projectile to insure proper cleanliness. If flaring is required, this should also be done prior to cleaning. In this case, the use of a JIC nozzle will be necessary to mate properly with the flared end of the tubing. If special fittings are used that require crimping, then the use of an Ultra Clean projectile, in addition to the procedure described above, is also recommended after the assembly is complete. The tube-style projectile should be used to remove mandrel lubricants, grease or oil if encountered. Tube-style projectiles are also recommended for stainless steel tubing.

Pipe

We recommend use of the grinding projectile when rust is present, or an abrasive projectile for cleaning the inside of all types of carbon steel piping products. These projectiles may be used more than once if necessary, or until they wear out. After several passes with the grinding or abrasive projectiles, an Ultra Clean Projectile should be fired through the pipe, removing debris left behind by the previous projectiles. This can only be accomplished if the pipe has a relatively smooth surface. Our Grinding projectiles will negotiate sweep elbows only. The Ultra Clean projectile can also be soaked in corrosion inhibiting chemicals that will in effect be applied to the entire 360 degree inside surface as it passes from one end to the other.

The Ultra Clean UC-D1 Super-Dry Compressed Air Dryer is recommended for all cleaning procedures. This ensures that only clean, dry air is used to move projectiles through the hose, avoiding re-contamination from air particulates. See page 18 for details.



UC-EL1.25 1 1/4" Economy Launcher & Kits

Features & Benefits

- Capable of cleaning 1/8" through 1-1/4" hose, tube or pipe.
- Has a quarter turn locking ring for easy nozzle change and projectile loading.
- The UC-EL1.25 is constructed of durable brass and aluminum internal parts, strong plastic handle and anodized aluminum firing head and locking ring.
- Effortless to operate because of its simplistic design.
- Ideal for mobile and job site applications because of its size and portability.

Air Requirements

- 80 PSI (5.5 Bar) minimum to 110 PSI (7.5 Bar) maximum.
- 1/2" ID air hose to ensure 55 SCFM (1.6 m³/min) air flow.
- 5 micron filter and regulator with gauge are strongly suggested!

Available Kits (2)

- Kits are customizable based on customer requirements. Call us to discuss your specific needs.
- Information on kit items can be found throughout the Clean Easy section of this catalog.

UC-EL7 Kit



Includes:

- UC-EL1.25 Launcher
- 7 Hose Nozzles
- Case
- Free Launcher Stand!

UC-EL7-DP Kit



Includes:

- UC-EL1.25 Launcher
- 7 Hose Nozzles
- Case
- Catcher Bucket
- Projectiles: 7mm through 40mm
- Free Launcher Stand!

Additional nozzles for JIC and tube applications are also available if required.

UC-HL2 2" Launcher & Kits



Features & Benefits

- Capable of cleaning 1/8" through 2" hose, tube or pipe.
- UC-HL2 Launcher is supplied with a Full Flow Quick Release Coupling and 360 degree Rotary Plug for proper air flow and non-fatigue operator use.
- Safety Release Bar that locks the faceplate into a closed position for firing Ultra Clean Projectiles.
- Manufactured from precision machined aluminum and fully anodized for harsh environments and heavy use.
- Ideal for production hose and tube shops, mobile hose fabricators and job site applications due to its simplistic design, size and portability.

Air Requirements

- 80 PSI (5.5 Bar) minimum to 110 PSI (7.5 Bar) maximum.
- 1/2" ID air hose to ensure 55 SCFM (1.6 m³/min) air flow.
- 5 micron filter and regulator with gauge are strongly suggested!

Available Kits (3)

- Kits are customizable based on customer requirements. Call us to discuss your specific needs.
- Information on kit items can be found throughout the Clean Easy section of this catalog.

UC-HL-9-2 Kit



Includes:

- UC-HL2 Launcher
- Adapter Ring
- Case
- 9 Hose Nozzles, 1/4" through 2"
- Free Launcher Stand!

UC-HL-25-2 Kit



Includes:

- UC-HL2 Launcher
- Adapter Ring
- Case
- 25 Hose, Tube, JIC, FFORX Nozzles 1/4" through 2"
- Free Launcher Stand!

UC-CAP Kit



Includes:

- UC-HL2 Launcher
- Adapter Ring
- 19 Nozzles
- Case
- Projectiles: 7mm through 60mm
- Catcher Bucket
- Free Launcher Stand!

Great Starter Kit!

Optional: A UC-NH25 Nozzle Holder can be substituted for the Carrying Case for an additional charge. Go to page 25 for details on the Nozzle Holder.





UC-HL3.5 3 1/2" Launcher & Kits

Features & Benefits

- Capable of cleaning 1/8" through 3-1/2" hose, tube or pipe.
- UC-HL3.5 Launcher is supplied with a Full Flow Quick Release Coupling and unique 360 degree Rotary Plug for proper air flow and non-fatigue operator use.
- UC-HL3.5 Launcher requires a UC-AR2 adapter ring for nozzles 1/8" through 1-1/4" and a UC-AR3 for nozzles 1-1/2" and 2". The unique UC-U55/90 Universal Nozzle (2-1/8" through 3-1/2") does not require an adapter ring.
- Manufactured from precision machined aluminum and fully anodized for harsh environments and heavy use.
- Ideal for production hose and tube shops, mobile hose fabricators and job site applications because of its simplistic design, size and portability.

Air Requirements

- 80 PSI (5.5 Bar) minimum to 110 PSI (7.5 Bar) maximum.
- 1/2" ID air hose to ensure 55 SCFM (1.6 m³/min) air flow.
- 5 micron filter and regulator with gauge are strongly suggested!

Available Kit (1)

- Kits are customizable based on customer requirements. Call us to discuss your specific needs.
- Information on kit items can be found throughout the Clean Easy section of this catalog.

UC-HL-1-3.5 Kit



Includes:

- UC-HL3.5 Launcher
- UC-AR2 & UC-AR3 Adapter Ring
- UC-U55/90 Nozzle
- Case
- Free Launcher Stand!

UC-HL4.5 4½" Launcher & Kits



Features & Benefits

- Capable of cleaning 1/8" through 4-1/2" hose, tube or pipe.
- UC-HL4.5 Launcher comes complete with the UC-4.5LN aluminum locking nozzle.
- UC-HL4.5 Launcher is supplied with a -8 SAE male flare and female swivel with 1/2" hose barb for correct SCFM air flow requirements.
- Capable of passing 50% more SCFM than our other launchers. This is extremely important when doing applications above 3-1/2" and long lengths of hose, tube or pipe.
- Manufactured from precision machined aluminum and fully anodized for harsh environments and heavy use.
- Ideal for job site applications because of its simplistic design, size and portability.
- The UC-HL4.5 is capable of cleaning 1/8" through 3-1/2" when combined with our adapter rings and nozzles using the UC-LR locking ring in place of the UC-4.5LN locking nozzle.

Air Requirements

- 80 PSI (5.5 Bar) minimum to 110 PSI (7.5 Bar) maximum.
- 1/2" ID air hose to ensure 110 SCFM (3.1 m³/min) air flow.
- 5 micron filter and regulator with gauge are strongly suggested!

Available Kit (1)

- Kits are customizable based on customer requirements. Call us to discuss your specific needs.
- Information on kit items can be found throughout the Clean Easy section of this catalog.

UC-HL-1-4.5 Kit



Includes:

- UC-HL4.5 Launcher
- UC-AR2 Adapter Ring
- UC-AR3 Adapter Ring
- UC-LR Aluminum Locking Ring
- UC-H4.5LN Aluminum Locking Nozzle
- Free Launcher Stand!

Ultra Clean Projectile Kits

Projectiles

UC-P1-Projectile Kit



Includes:

- 11 bags of Ultra Clean Projectiles for cleaning out hose, tube and pipe applications up to 1/4" to 1-1/4" ID.
- These projectiles also form a sub-kit that is included in the UC-EL7-DP Economy Launcher Kit.

UC-P2-Projectile Kit



Includes:

- 13 bags of Ultra Clean Projectiles for cleaning out hose, tube and pipe applications up to 1/4" to 2" ID.
- These projectiles also form a sub-kit that is included in the UC-CAP 2" Starter Kit.

Model	Size	Bag Qty
UC02	2mm	100
UC03	3mm	100
UC04	4mm	100
UC05	5mm	100
UC06	6mm	100
UC07	7mm	100
UC08	8mm	100
UC10	10mm	100
UC12	12mm	100
UC14	14mm	100
UC16	16mm	100
UC18	18mm	100
UC20	20mm	50
UC22	22mm	50
UC24	24mm	50
UC26	26mm	50
UC28	28mm	40
UC30	30mm	40
UC33	33mm	40
UC36	36mm	30
UC40	40mm	30
UC45	45mm	20
UC50	50mm	20
UC55	55mm	15
UC60	60mm	15
UC65	65mm	10
UC70	70mm	10
UC75	75mm	10
UC80	80mm	10
UC85	85mm	10
UC90	90mm	10
UC95	95mm	10
UC100	100mm	10
UC110	110mm	10
UC120	120mm	10
UC130	130mm	10
UC140	140mm	10
UC150	150mm	10

↑↑ Grey area within this line included in UC-P1-Projectile Kit. ↓ Grey area within this line included in UC-P2-Projectile Kit. ↓

Note: All projectile sizes are also available in bulk quantities. Ask your sales rep or call for details.

UC-BM1.25

1 1/4" Bench Mount Launcher



Features & Benefits

- Capable of cleaning 1/8" through 1-1/4" hose, tube or pipe.
- The Bench Mount Launcher is supplied with a 5 micron air filter, pneumatic foot switch and twin line air hose and your choice of 8 nozzles 1/4" through 1-1/4".
- Effortless to operate with a cycle time of 1.2 seconds.
- Ideal for production type environments because of its speed and simplicity.
- Stainless steel housing with anodized aluminum internal components.

Air Requirements

- 80 PSI (5.5 Bar) minimum to 110 PSI (7.5 Bar) maximum.
- 1/2" ID air hose to ensure 38 SCFM (1.1 m³/min) at 80 PSI (5.5 Bar) air flow.
- Large industrial compressor strongly recommended.
- UC-D1 Super-Dry Compressed Air Dryer strongly recommended.

Accessory

UC-BM-HH Hand-Held Launcher for Bench Mount

- Lends flexibility to the Bench Mount Launcher by allowing the user to easily take a Hand Held Launcher Accessory directly to a hose or tube.
- Standard 6' extension hose/cable easily attaches to the Bench Mount, no tools required.
- UC-BM-HH Launcher is specially designed for attachment and use with the UC-BM1.25 only.
- Pneumatic trigger in the UC-BM-HH Launcher activates the firing cycle in the UC-BM1.25.
- Utilizes all size nozzles compatible with the Bench Mount unit.
- Air requirements are the same as for the Bench Mount unit.



Hand-held launcher extension quickly and easily attaches to the Bench Mount unit.

UC-PVS-III Projectile Verification System

Guarantees a projectile is never left inside a hose or tube that has been cleaned!



Features & Benefits

- Intuitive touchscreen allows for easy navigation and set-up in multiple languages.
- (3) Three Cleaning Modes with time-adjustable air blow.
- Capable of logging data such as projectile counts and faults to monitor that none are left inside a hose or tube that has been cleaned.
- Green light on Containment Barrel goes on and air blow automatically stops when cleaning process is complete and projectile is verified.
- Employs an electronic foot switch to activate the firing sequence of the UC-BM1.25 (1/8" through 1-1/4") Bench Mount Launcher.
- The UC-HL-PVS (1/8" – 2") Electronic Hand Held Launcher can be fired by either the electronic foot switch or built-in electronic trigger.
- Optional remote monitoring (ethernet-based)

Air Requirements

- 80 PSI (5.5 Bar) minimum to 110 PSI (7.5 Bar) maximum.
- UC-D1 Super-Dry Compressed Air Dryer strongly recommended.

Detailed features on page 15. . .

Containment Barrel

- Catches and verifies that the projectile and contamination have been expelled.
- Includes a wheeled dolly for ease of use.
- Large filter allows compressed air to escape while retaining contamination residue.
- Built-in sight gauge indicates when system needs emptying.
- Indicator lights signify at which stage system is operating.



Green = ready to launch a projectile and/or has successfully verified a caught projectile.

Yellow blinking = projectile has been fired and is on its way through a hose or tube.

Red = projectile was not verified and may still be in the hose or launcher.

Touchscreen Display

- Touchscreen display allows user to navigate quickly and easily through the set-up process, prompting user to select:
 - Language
 - Operator I.D.
 - Projectile size to be counted and verified
 - Cleaning Mode
- Optional Ethernet-based technology allows the system to be integrated into a network, enabling the process to be monitored from a remote computer.

Cleaning Mode Selection

A Cleaning Mode must be selected on the touchscreen at the start of each use. This allows the user to select the proper mode based on the assembly processing and contamination level of the hose or tube production.



- **Normal Clean:** One projectile is propelled from each side of the hose assembly. Recommended for hoses that have undergone the cutting process and no skiving.
- **Air Purge +1 Projectile:** Based on length of hose and contamination and particle levels, a timer is set to determine duration of air blow. Timer is factory set to 3-seconds. Air blow is adjustable starting at 1-second. After air blow stops, a projectile must then be loaded and fired. Recommended for hoses with low-to-medium contamination and particle levels, particularly from skiving.
- **Air Purge +2 Projectiles:** Same as Air Purge +1 Projectile, but recommended for hoses with high contamination and particle levels, particularly from skiving.

5 Micron Filter, Regulator, Gauge

- Requires the Ultra Clean UC-QRC-C quick disconnect coupling and a 1/2" I.D. (13mm) air hose to ensure correct SCFM air requirements for the Control Station.
- Incoming air is filtered to 5 micron.
- Regulator and gauge adjustment helps ensure proper operating pressure of 80 to 110 PSI maximum (5-1/2 to 7-1/2 Bar).



Containment Barrel Connector & Foot Switch

- 8-pin military-style plug secures the Containment Barrel cord to the Control Station.
- Electric Foot Switch provides hands-free operation to trigger the firing process.



UC-BM1.25 Air Supply

- Air supply for the Bench Mount is located on the left side of the Control Station.
- UC-D1 Super-Dry Compressed Air Dryer strongly recommended.



UC-HL-PVS Air Supply

- Air supply for the Hand Held Launcher is located on the right side of the Control Station.
- UC-D1 Super-Dry Compressed Air Dryer strongly recommended.



24 Volt DC Power Supply

- Power Supply converts 240V AC (Europe) or 110V AC to 24V DC.



UC-AL AutoLoader™ System

Made to Order

Features & Benefits

- Semi-automatic Projectile Launcher and Projectile Verification System.
- Removes internal contamination from hoses, tubes or pipes quickly and efficiently in a production environment.
- Ideal for high volume production cells making hose or tube assemblies.
- Fully integratable in automated tube manufacturing processes.
- Can be programmed to alternate between wet and dry cleaning using the optional solvent tank.
- Verifies projectile has exited hose, tube or pipe and entered the Containment Barrel along with expelled contamination.
- Cleans hoses, tubes and pipes with an internal diameter of 3/16" inch (5mm) through 1-1/8" inch (29mm).
- Handles up to 8 Cores and 5 Funnels for orientation and loading projectiles from 6mm through 36mm in diameter.
- Remote mounted firing device and/or hand held firing device options. Includes connector hose and fittings.
- Converts incoming electric from 110V AC-60Hz or 240V AC- 50Hz to 24V DC and comes with appropriate electrical cord for easy installation.
- Built in pre-programmed PLC, (Programmable Logic Controller) guides set-up of Cores, Funnels and correct Ultra Clean Projectile selection.
- Built-in Projectile Counter for counting fired and verified projectiles.
- Firing Station Cabinet made from stainless steel.
- Built-in Air Ionizer for removing static electricity from the Projectiles and Funnel for better loading, orientation and firing.
- Containment Barrel made of plastic and has a stainless steel chute assembly with green, yellow and red lights to indicate system and projectile mode (ready, firing, verified).
- Pressure regulator and gauge to adjust operating pressure between 80 PSI (5.5) to 110 PSI (7.5 Bar).



Easy Installation

The Ultra Clean AutoLoader can be installed in any production environment. The wheels make the unit mobile throughout the workshop. The AutoLoader requires compressed air, for which the UC-D1 Super-Dry Compressed Air Dryer is strongly recommended. Electrical requirement is 110V AC 60Hz or 240V AC 50Hz electrical power. The AutoLoader has a regular prong to fit outlets around the world.

Detailed features on page 17 . . .

Operating Panel with PLC Touchscreen, Pressure Regulator & Gauge

- Easy-to-operate dashboard to auto-select proper core and funnel size based on user input of projectile size for a hassle-free firing process.
- The Pressure Regulator sets operating pressure at between 80 PSI (5.5 bar) and 110 PSI (7.5 bar).



Solvent Injection System

- Optional Solvent Injection System allows AutoLoader to clean tube assemblies with a special fluid to attack grease and other contaminants that require wet cleaning.
- The PLC touch screen can be programmed to systematically inject the solvent, then launch a set number of projectiles to further clean and dry the assembly.
- An ideal system for tube manufacturers.



Containment Barrel

- Catches and verifies that the projectile and contamination have been expelled.
- Indicator lights signify at which stage system is operating. Includes a wheeled dolly for ease of use.
- Large filter allows compressed air to escape while retaining contamination residue.
- Built-in sight gauge indicates when system needs emptying.



Handheld Launcher

- Included Handheld Launcher for quickly launching projectiles into the hose or tube assembly.
- Handheld Launcher holds the proper size nozzle that matches the hose or tube assembly, ensuring an airtight seal between the launcher and the assembly.
- Handheld Launcher is portable, enabling cleaning of assemblies anywhere, rather than transporting to one location to be cleaned.
- Firing process is activated by an electronic trigger or optional foot switch.



Storage for Cores and Funnels

- 8 core and 5 funnel sizes available.
- Core and funnel sizes determined based on projectile size needs.
- Core stores projectiles, with system shooting one projectile every 2 seconds.
- Core's High/Low Sensor signals the funnel to send more projectiles when volume is low.
- Funnel uses compressed air only when necessary, saving energy and wear and tear on projectiles.



Core & Funnel Combinations

Ultra Clean Projectiles	Core Number	Funnel Number
UC06 or UC07	1	A
UC08 or UC10	2	A
UC12 or UC14	3	A
UC16 or UC18	4	A
UC20 or UC22	5	B
UC24 or UC26	6	C
UC28 or UC30	7	D
UC33 or UC36	8	E

UC-D1 Super-Dry Compressed Air Dryer

The UC-D1 Super-Dry Compressed Air Dryer contains two highly efficient polypropylene coalescer elements at inlet and outlet ports to absorb oil and all solid air particles. Also included, one desiccant bag specifically designed to absorb water vapors and humidity from your compressed air system. The clean, dry air provided by the Super-Dry Compressed Air Dryer is highly recommended for use with the Ultra Clean Bench Mount Launcher, Projectile Verification System and AutoLoader System.

Standard Features & Benefits

Housings for Flows up to 300 SCFM:

- Heavy duty aluminum casting for high durability and corrosion resistance
- Powder coated exterior for added durability
- V-band stainless steel clamps for easy removal of cartridge replacement covers
- Optimized air flow through housing minimizes pressure drop
- Wall mounting brackets included
- 3 stages in one unit; separation, filtration and drying

Enhanced Performance

- Easy replaceable self-contained desiccant cartridges
- High efficiency polypropylene coalescent elements
- Optimum filter efficiency even at low air flows
- 10-year manufacturer's warranty
- Life expectancy: 25 years
- Pressure dew point: -40° F
- Maximum working pressure: 150 PSIG



UC-D1 Super-Dry Compressed Air Dryer

- Air Flow @ 100 PSID: 70 scfm
- Inlet/Outlet NPT: 1"
- Dimensions: 6" w, 19" h
- Weight: 20 lbs.
- Replacement Kit: UC-ED1
- Maximum inlet temp: 100° F (38° C)
- Maximum inlet pressure: 150 PSIG

Premium Options

Humidity & Temperature Indicator UC-HGT

- Indicates optimum cartridge replacement based on % relative humidity
- Relative Humidity % 10-80
- Temperature °F: 20-100
- Connection NPT: 1/4



Automatic Timer Drain UC-TD

- Efficient drainage of condensate
- Extends cartridge life of the dryer
- Interval Time min.: 0.5 - 45
- Discharge Time sec.: 0.5 - 10
- In & Out Ports NPT: 1/4



Ball Valve Strainer UC-BVS

- Isolates and protects drain
- Inlet Port NPT: 1/2
- Outlet Port NPT: 1/4
- Material: Brass



Clean, dry air is highly recommended for use with the Ultra Clean Bench Mount Launcher, Projectile Verification System, and the AutoLoader.

Nozzles & Adapter Rings

A range of nozzles are available, allowing the Ultra Clean System to be used on different sizes and types of hose, tube and pipe, as well as coupling configurations. Custom nozzles can be designed upon request.

Hose Nozzles

The hose nozzle is inserted into the ID of the hose. Hose nozzles also work on pipe, heavy walled tubing and many coupling configurations. It is our most popular nozzle. Hose nozzles have the "UC-H" designation and are blue in color for easy identification. Aluminum, hard coat anodized nozzles are available in hose style from -4 (1/4") through -32 (2").



Tube Nozzles (Nominal Inch)

Nominal inch tube nozzles have a stop on the inside that forms an airtight seal when the tube is fully inserted into the nozzle. Nominal inch tube nozzles are white in color and designated with a "UC-T" in the part number. Some "UC-T" nozzles may also be designated for JIC use as reflected in the part number.



Fitting Nozzles

FFORX: Special nozzle designed to accommodate -4 Flat Face O-Ring Style Fittings. These fittings may be referred to as Face Seal, Seal Lok or FFORX.



The white JIC nozzles are molded with a special 37° male flare at the tip to fit the female JIC fittings on hose and tube assemblies. JIC nozzles are marked with the "UC-J" designation, followed by appropriate size.

Tube Nozzles (Metric)

Metric tube nozzles have a stop on the inside that forms an airtight seal when the tube is fully inserted into the nozzle. Metric tube nozzles are designed to match metric tubing, and are similarly based on outside diameter (OD) x wall thickness. Metric tube nozzle designations utilize the largest wall thickness for the given OD, but fit all smaller wall thicknesses as well. Metric tube nozzles are grey in color.



Universal Nozzle

UC-U55/90: The Universal Nozzle is similar to our hose style nozzle. It has a size range 2-1/8" (55mm) to 3-1/2" (90mm). The Universal Nozzle can be cut off in 10mm increments to suit your application.



Aluminum Locking Nozzle

UC-4.5LN: This nozzle is supplied with the UC-HL4.5 Launcher for 3.5" (90mm) to 4.5" (115mm) applications.



Adapter & Locking Rings

- UC-AR1 fits the UC-HL2 Launcher and all nozzle types from 1/8" through 1-1/4".
- UC-AR2 fits the UC-HL3.5 Launcher and all nozzle types from 1/8" through 1-1/4".
- UC-AR3 fits the UC-HL3.5 Launcher and all nozzle types from 1-1/2" through 2".
- UC-LR fits the UC-HL3.5 & UC-HL4.5 Launchers and the AR2, AR3 & UC-U55/90 nozzles.



Projectile Types & Applications

The projectile cleans by being compressed against the internal surface of the hose, tube or pipe. This pressure is achieved as the projectile is approximately 20% to 30% larger than the internal diameter of the hose, tube or pipe. For instance, a 2" (50mm) projectile is recommended for a 1-1/2" (38mm) hose.

Individual circumstances may require a smaller or larger projectile. If the projectile is too large it will not leave the nozzle, and if it is too small it will not clean effectively. The enormous variety in the types of couplings available today could also mean in some circumstances that the recommended size is inappropriate. When cleaning assemblies, a reduction in projectile size may be appropriate, as all recommendations are based on the most commonly used coupling sizes. Custom projectiles can also be developed.

All Ultra Clean projectiles are made from virgin materials with a specific cell structure and density. This ensures a quality product that is capable of achieving most ISO-4406-99 and ISO-4405 cleanliness levels when our assembly procedures are followed. Ultra Clean never uses rebonded, scrap or recycled materials in our Ultra Clean Projectile offerings like some other manufacturers.

Ultra Clean

Universal application for use with hose, tube, pipe and assemblies. Removes fine particles of loose contamination and can also be used for product purging. *Size range: 2mm - 95mm.*



Tube

For use with all types of tubing or pipes - and strongly recommended for stainless steel - with mild to medium amounts of contamination, surface rust or scale build-up. Removes mandrel lubricants, grease and oil after the bending process. *Size range: 6mm - 75mm.*



Abrasive

For use with tubes or pipes to loosen mild to medium amounts of contamination, surface rust or scale build-up.

Always follow-up with an Ultra Clean projectile to clear away loosened contaminants and verify cleanliness.

Can be used multiple times.

Size range: 6mm - 120mm.



Grinding

For use on straight lengths of tube or pipe to loosen medium to high amounts of contamination, surface rust or scale build-up.

Always follow-up with an Ultra Clean projectile to clear away loosened contaminants and verify cleanliness.

Can be used multiple times.

Sizes made to order.



Ultra Clean 100mm-150mm

Ultra Clean Projectiles 100mm and larger are provided with a laminated backer to prevent air permeation. The laminated backer should be loaded into the nozzle last so that the air is pushing against it.



Bulk Projectiles

Ultra Clean Technologies also offers Ultra Clean & Tube style projectiles packaged in bulk quantities. The bulk projectile program complements the Bench Mount Launchers for use in a production type atmosphere.

Recommended Sizing Chart Hose and Hose Assemblies

HOSE**			
HOSE ID		NOZZLE	ULTRA CLEAN PROJECTILE
NOM. IN.	DN MM		
3/16"	5	UC-H03	UC06
1/4"	6	UC-H06	UC10 OR UC12
5/16"	8	UC-H08	UC12 OR UC14
3/8"	10	UC-H10	UC14 OR UC16
1/2"	13	UC-H13	UC18 OR UC20
5/8"	16	UC-H16	UC22
3/4"	19	UC-H19	UC26
1"	25	UC-H25	UC33 OR UC36
1-1/4"	32	UC-H32	UC40 OR UC45
1-1/2"	38	UC-H38	UC50 OR UC55
2"	50	UC-H50	UC60 OR UC65
2-1/2"	63	UC-U55/90	UC75
3"	76	UC-U55/90	UC85
3-1/2"	89	UC-U55/90	UC100
4"	102	UC-4.5LN	UC120
4-1/2"	114	UC-4.5LN	UC130

ASSY W/FJIC		
FJIC SIZE	NOZZLE	ULTRA CLEAN PROJECTILE
DASH		
-4	UC-J06	UC06 OR UC07
-6	UC-J10	UC12
-8	UC-J13/T13	UC16
-10	UC-J16/T16	UC22
-12	UC-J19/T19	UC26
-16	UC-J25/T22	UC33
-20	UC-J32/T25	UC40
-24	UC-J38/T38	UC50
-32	UC-J50/T50	UC60

ASSY W/FFORX		
FFORX SIZE	NOZZLE	ULTRA CLEAN PROJECTILE
DASH		
-4	UC-4FFORX	UC06 OR UC07
-6	UC-H06	UC12
-8	UC-H10	UC16
-10	UC-H13	UC22
-12	UC-H16	UC26
-16	UC-H19	UC33
-20	UC-H25	UC40

ASSY W/CODE 61 & 62 FLANGES		
FLANGE SIZE	NOZZLE	ULTRA CLEAN PROJECTILE
DASH		
-8	UC-H10	UC16
-10	UC-H13	UC22
-12	UC-H16	UC26
-16	UC-H19	UC33
-20	UC-H25	UC40
-24	UC-H32	UC50
-32	UC-H38	UC60

**Use larger recommended Ultra Clean Projectiles when cutting hose with an abrasive wheel. The above sizes are recommendations. Due to different manufacturers, types of fittings, and the amount of contamination in the line, the size projectile may need to be adjusted.

Tube Sizing Chart - Nominal Inch

OD X WALL	NOZZLE	ULTRA CLEAN PROJECTILE	ABRASIVE PROJECTILE	TUBE PROJECTILE
1/8" X .030"	UC-T03	UC04	--	--
1/4" X .028"	UC-T06	UC08	UC-A07	UC07-TUBE
1/4" X .035"	UC-T06	UC08	UC-A07	UC07-TUBE
1/4" X .049"	UC-T06	UC08	UC-A07	UC06-TUBE
1/4" X .065"	UC-T06	UC07	--	UC06-TUBE
5/16" X .028"	UC-T08	UC12	UC-A10	--
5/16" X .035"	UC-T08	UC12	UC-A10	UC07-TUBE
3/8" X .028"	UC-T10	UC14	UC-A12	UC10-TUBE
3/8" X .035"-.049"	UC-T10	UC14	UC-A12	UC10-TUBE
3/8" X .065"	UC-T10	UC12	UC-A10	UC10-TUBE
1/2" X .035"	UC-J13/T13	UC16	UC-A16	UC14-TUBE
1/2" X .049"	UC-J13/T13	UC16	UC-A16	UC12-TUBE
1/2" X .065"	UC-J13/T13	UC16	UC-A14	UC12-TUBE
1/2" X .083"	UC-J13/T13	UC14	UC-A12	UC12-TUBE
5/8" X .049"	UC-J16/T16	UC22	UC-A20	UC16-TUBE
5/8" X .065"	UC-J16/T16	UC20	UC-A18	UC16-TUBE
5/8" X .083"	UC-J16/T16	UC20	UC-A18	UC14-TUBE
3/4" X .049"-.065"	UC-J19/T19	UC26	UC-A24	UC20-TUBE
3/4" X .095"	UC-J19/T19	UC22	UC-A20	UC18-TUBE
7/8" X .049"	UC-J25/T22	UC33	UC-A30	UC26-TUBE
7/8" X .065"	UC-J25/T22	UC30	UC-A28	UC22-TUBE
7/8" X .095"	UC-H16	UC28	UC-A26	UC22-TUBE
1" X .065"	UC-J32/T25	UC33	UC-A30	UC28-TUBE
1" X .083"-.095"	UC-J32/T25	UC33	UC-A30	UC26-TUBE
1" X .120"	UC-J32/T25	UC30	UC-A28	UC26-TUBE
1-1/4" X .065"	UC-T32	UC40	UC-A40	UC33-TUBE
1-1/4" X .083"	UC-T32	UC40	UC-A36	UC33-TUBE
1-1/4" X .095"	UC-T32	UC40	UC-A36	UC33-TUBE
1-1/4" X .109"	UC-T32	UC36	UC-A36	UC33-TUBE
1-1/4" X .120"	UC-T32	UC36	UC-A33	UC33-TUBE
1-1/2" X .065"-.120"	UC-J38/T38	UC50	UC-A45	UC40-TUBE
1-1/2" X .134"-.148"	UC-J38/T38	UC45	UC-A40	UC40-TUBE
2" X .065"-.120"	UC-J50/T50	UC60	UC-A55	UC50-TUBE
2" X .134"-.188"	UC-J50/T50	UC55	UC-A50	UC50-TUBE

Tubing must be deburred prior to firing projectiles. Depending on the type of contamination present in the tube, abrasive projectiles may be used to remove rust and scale. Always use an Ultra Clean projectile after the use of an abrasive projectile. Tube projectiles should be used to remove mandrel lubricants, grease and oil. If the operator is unsure which type or size projectile to use, please call us for technical assistance.

Recommended Sizing Chart Metric Tubing

OD X WALL	NOZZLE	CLEAN PROJ.	PROJ.		OD X WALL	NOZZLE	CLEAN PROJ.	PROJ.	
		UC	ABR.	TUBE			UC	ABR.	TUBE
3 X .5	UC-T03	UC04	--	--	20 X 2.5	UC-20X3.0	UC24	UC-A20	UC18-TUBE
3 X .7	UC-T03	UC03	--	--	20 X 3.0	UC-20X3.0	UC22	UC-A20	UC18-TUBE
6 X 1.0	UC-6X1.5	UC07	UC-A06	UC06-TUBE	22 X 1.0	UC-22X2.0	UC30	UC-A28	UC26-TUBE
6 X 1.5	UC-6X1.5	UC07	UC-A06	--	22 X 1.5	UC-22X2.0	UC30	UC-A28	UC26-TUBE
8 X 1.0	UC-8X1.5	UC10	UC-A07	UC07-TUBE	22 X 2.0	UC-22X2.0	UC30	UC-A28	UC26-TUBE
8 X 1.5	UC-8X1.5	UC10	UC-A07	UC07-TUBE	25 X 2.0	UC-25X3.0	UC33	UC-A30	UC28-TUBE
10 X 1.0	UC-10X1.5	UC14	UC-A12	UC12-TUBE	25 X 2.5	UC-25X3.0	UC30	UC-A28	UC26-TUBE
10 X 1.5	UC-10X1.5	UC14	UC-A12	UC12-TUBE	25 X 3.0	UC-25X3.0	UC30	UC-A28	UC26-TUBE
12 X 1.0	UC-12X2.0	UC16	UC-A14	UC14-TUBE	28 X 2.0	UC-28X2.5	UC36	UC-A33	UC33-TUBE
12 X 1.5	UC-12X2.0	UC16	UC-A14	UC14-TUBE	28 X 2.5	UC-28X2.5	UC36	UC-A33	UC30-TUBE
12 X 2.0	UC-12X2.0	UC14	UC-A12	UC12-TUBE	30 X 2.0	UC-30X4.0	UC36	UC-A33	UC33-TUBE
14 X 1.0	UC-14X2.0	UC18	UC-A16	UC16-TUBE	30 X 2.5	UC-30X4.0	UC36	UC-A33	UC30-TUBE
14 X 1.5	UC-14X2.0	UC16	UC-A14	UC14-TUBE	30 X 3.0	UC-30X4.0	UC36	UC-A33	UC30-TUBE
14 X 2.0	UC-14X2.0	UC16	UC-A14	UC14-TUBE	30 X 4.0	UC-30X4.0	UC36	UC-A33	UC30-TUBE
15 X 1.0	UC-15X2.0	UC20	UC-A18	UC16-TUBE	35 X 2.0	UC-35X3.0	UC45	UC-A40	UC40-TUBE
15 X 1.5	UC-15X2.0	UC18	UC-A16	UC16-TUBE	35 X 3.0	UC-35X3.0	UC40	UC-A36	UC36-TUBE
15 X 2.0	UC-15X2.0	UC16	UC-A14	UC14-TUBE	35 X 4.0	UC-H25	UC40	UC-A36	UC33-TUBE
16 X 1.0	UC-16X2.5	UC22	UC-A20	UC18-TUBE	35 X 5.0	UC-H25	UC36	UC-A33	UC30-TUBE
16 X 1.5	UC-16X2.5	UC20	UC-A18	UC16-TUBE	38 X 2.5	UC-38X5.0	UC50	UC-A45	UC40-TUBE
16 X 2.0	UC-16X2.5	UC18	UC-A16	UC16-TUBE	38 X 3.0	UC-38X5.0	UC50	UC-A45	UC40-TUBE
16 X 2.5	UC-16X2.5	UC16	UC-A14	UC14-TUBE	38 X 4.0	UC-38X5.0	UC45	UC-A40	UC40-TUBE
18 X 1.0	UC-18X2.5	UC24	UC-A22	UC20-TUBE	38 X 5.0	UC-38X5.0	UC40	UC-A36	UC36-TUBE
18 X 1.5	UC-18X2.5	UC24	UC-A20	UC18-TUBE	42 X 2.0	UC-42X3.0	UC55	UC-A50	UC50-TUBE
18 X 2.0	UC-18X2.5	UC22	UC-A20	UC18-TUBE	42 X 3.0	UC-42X3.0	UC50	UC-A50	UC45-TUBE
18 X 2.5	UC-18X2.5	UC20	UC-A18	UC16-TUBE	50 X 3.0	UC-50X6.0	UC60	UC-A55	UC55-TUBE
20 X 1.5	UC-20X3.0	UC26	UC-A24	UC22-TUBE	50 X 5.0	UC-50X6.0	UC55	UC-A55	UC50-TUBE
20 X 2.0	UC-20X3.0	UC24	UC-A22	UC20-TUBE	50 X 6.0	UC-50X6.0	UC55	UC-A50	UC50-TUBE

Tubing must be deburred prior to firing projectiles. Depending on the type of contamination present in the tube, abrasive projectiles may be used to remove rust and scale. Always use an Ultra Clean projectile after the use of an abrasive projectile. If the operator is unsure which type or size projectile to use, please call us for technical assistance.

Pipe Sizing Chart

SCH 40	NOZZLE	ULTRA CLEAN PROJECTILE	ABRASIVE PROJECTILE	GRINDING PROJECTILE
1/4"	UC-H08	UC14	UC-A12	UC-GR10
3/8"	UC-H13	UC18	UC-A16	UC-GR14 or UC-GR16
1/2"	UC-H16	UC20	UC-A18	UC-GR16 or UC-GR18
3/4"	UC-H19	UC30	UC-A26	UC-GR22 or UC-GR26
1"	UC-H25	UC36	UC-A33	UC-GR26 or UC-GR33
1-1/4"	UC-H32	UC45	UC-A40	UC-GR40
1-1/2"	UC-H38	UC55	UC-A50	UC-GR50
2"	UC-H50	UC65	UC-A55 or UC-A60	UC-GR55
2-1/2"	UC-U55/90	UC75	UC-A70	UC-GR65
3"	UC-U55/90	UC85	UC-A80	UC-GR80
3-1/2"	UC-U55/90	UC100	UC-A95	--
4"	UC-4.5LN	UC120	UC-A110	--
SCH 80	NOZZLE	ULTRA CLEAN PROJECTILE	ABRASIVE PROJECTILE	GRINDING PROJECTILE
1/4"	UC-H06	UC12	UC-A10	UC-GR07
3/8"	UC-H10	UC16	UC-A14	UC-GR10 or UC-GR12
1/2"	UC-H13	UC20	UC-A16 or UC-A18	UC-GR16
3/4"	UC-H19	UC26	UC-A22	UC-GR20
1"	UC-H25	UC36	UC-A30	UC-GR26
1-1/4"	UC-H32	UC45	UC-A40	UC-GR33
1-1/2"	UC-H38	UC50	UC-A45	UC-GR40
2"	UC-H38	UC60	UC-A55	UC-GR50
2-1/2"	UC-H50	UC70	UC-A65	UC-GR60
3"	UC-U55/90	UC85	UC-A80	UC-GR75
3-1/2"	UC-U55/90	UC110	UC-A110	--
4"	UC-4.5LN	UC115	UC-A110	--
SCH 160	NOZZLE	ULTRA CLEAN PROJECTILE	ABRASIVE PROJECTILE	GRINDING PROJECTILE
1/2"	UC-H10	UC16	UC-A14	UC-GR12
3/4"	UC-H16	UC20	UC-A18	UC-GR16 or UC-GR18
1"	UC-H19	UC30	UC-A26	UC-GR22
1-1/4"	UC-H25	UC36	UC-A33	UC-GR30
1-1/2"	UC-H32	UC45	UC-A40	UC-GR33 or UC-GR40
2"	UC-H38	UC55	UC-A45 or UC-A50	UC-GR40 or UC-GR45
2-1/2"	UC-H50	UC65	UC-A60	UC-GR55 or UC-GR60
3"	UC-U55/90	UC75	UC-A70	GR70
4"	UC-U55/90	UC100	UC-A100	--

Abrasive projectiles may be used when there is a build-up of contamination, surface rust or scale. For pipe applications where there is a greater build-up of contamination, surface rust or scale, use a grinding projectile. Pipe must be straight for this projectile. NOTE: To ensure cleanliness, an Ultra Clean projectile must be used after abrasive and grinding projectiles. Please call if you need help in sizing your application for the correct nozzles and projectiles.

Launcher Stand



The Launcher Stand is an essential piece of equipment. It offers the following advantages to the operator:

- Offers an anchor in a situation where the operator needs both hands to lift the hose to the nozzle.
- Prevents damage to the launcher or nozzles, caused either by being dropped or receiving rough handling during routine work processes. (NOTE: Rough handling or abuse of equipment voids all warranties).
- Offers a permanent storage facility.
- The launcher is always ready for your hose, tube and pipe cleaning requirements.

The Launcher stand should be located in a convenient location that provides easy access in situations where the operator needs two hands to lift the work and where he can easily pick it up and put it back down again. Many operators use the launcher stand as a permanent storage place for the launcher, rather than continually removing the launcher from the carrying case.



Projectile Catcher



The Projectile Catcher is an integral part of the Ultra Clean System:

- Prevent injury to yourself, the customer or an innocent bystander should contamination (such as steel slivers, or fragments of wire) be forcefully propelled, along with the projectile from the inside of the hose, tube or pipe.
- Allows you to catch and visually ascertain the contamination itself, expelled by the projectile from the hose, tube or pipe.
- Use it as an "indicator" to determine the internal condition of the hose, tube or pipe.
- Maintain a clean and professional work space.
- Saves time, motion and cleaning costs by not having to constantly pick up after yourself.

The projectile catcher, as with all tools, should be located in a convenient and practical position. It is an essential part of the Ultra Clean System and should be planned into the workshop.

Nozzle Holder

The Nozzle Holder is a great alternative to leaving your nozzles in the carry case. It can be attached to a workbench and offers these additional advantages:

- Easy access during operation.
- Keeps the nozzles and the system in front of the workers eyes and makes them conscious of their obligations to follow set cleaning procedures.
- Becomes a promotional feature for customers.
- Accommodates 1/4" through 2" nozzles.



OilPure Technologies, Inc.

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January 13, 2001

Bruce Riley

ULTRA CLEAN TECHNOLOGIES CORP.

746 Shiloh Pike

Bridgeton, NJ 08302

Dear Bruce:

We evaluated a hydraulic hose provided by your firm. The hydraulic hose is 1" dia. x 24" wire hydraulic hose with the use of Ultra Clean Technologies Ultra Clean Projectiles. According to the particle count testing from OilPure laboratory, we found that the Ultra Clean hose cleaning device and their Ultra Clean Projectiles are capable of providing ISO code 13/10 oil cleanliness.

Test Procedure

1. The hose was rinsed with new hydraulic oil several times, 150 cc oil quantity in each rinse.
2. The hose is washed with the same oil quantity of new oil each time
3. New hydraulic oil is AW46 viscosity grade and filtered to ISO code 13/10 cleanliness before testing.
4. Laser light particle count is used as particle count analysis. Particle counter is made by HIAC/ROYCO and uses the ISO:4406 standard for particle count method. Special quality control for particle count testing is made to make sure that the particle count shows accurate reading.
5. All oil samples were tested twice to make sure that particle count reading confirms accuracy.

Test Result Findings

Particle Count (in one cc)	New Oil	Ultra Clean Projectiles / Marker Saw			
		<u>1st Rinse</u>		<u>2nd Rinse</u>	
ISO Code:	13/10	13/11	13/10	13/10	13/10
>5 microns	49	53	49	63	49
>10 microns	15	26	15	12	11
>15 microns	8	16	8	7	6
>25 microns	3	8	3	3	1
>50 microns	1	2	1	1	0
>75 microns	0	0	0	0	0

The ISO code 13/10 oil cleanliness can be expected after hose is cleaned by Ultra Clean Projectiles by ULTRA CLEAN TECHNOLOGIES. We hope that this test data will provide sufficient information for ULTRA CLEAN TECHNOLOGIES' customer regarding oil cleanliness after ULTRA CLEAN hose cleaning.

Yours sincerely,

Vichai Srimongkolkul
Technical Director