

PRODUCT MANUAL

Vol. 13,
Issue 1



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 the internal contamination, removing dirt, gunk and oil. Now your clean oil will stay clean as it reaches those 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 12 for details.

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



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)

1. **UC-EL7 Kit** (pictured): UC-EL1.25 Launcher, 7 Hose Nozzles, Case.
2. **UC-EL7-DP Kit** (pictured): UC-EL1.25 Launcher, 7 Hose Nozzles, Case, Catcher Bucket, Projectiles 7mm through 40mm.

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

Pictured:
UC-EL7-DP Kit



UC-HL2 2" Launcher



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)

1. **UC-CAP Kit** (pictured): UC-HL2 Launcher, Adapter Ring, 19 Nozzles, Case, Catcher Bucket, Projectiles 7mm through 60mm, Launcher Stand.
2. **UC-HL-9-2 Kit**: UC-HL2 Launcher, Adapter Ring, Case, 9 Hose Nozzles 1/4" through 2".
3. **UC-HL-25-2 Kit**: UC-HL2 Launcher, Adapter Ring, Case, 25 Hose, Tube, JIC, FFORX Nozzles 1/4" through 2".



Pictured: UC-CAP Kit

UC-HL3.5 3½" Launcher



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)

1. UC-HL-1-3.5 Kit (pictured): UC-HL3.5 Launcher, UC-AR2 & UC-AR3 Adapter Ring, UC-U55/90 Nozzle, Case.



Pictured: UC-HL-1-3.5

UC-HL4.5 4½" Launcher



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)

1. UC-HL-1-4.5 Kit (pictured): UC-HL4.5 Launcher, UC-AR2 & UC-AR3 Adapter Ring.



Pictured: UC-HL-1-4.5

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 7 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.

UC-PVS-II Projectile Verification System



Control Station



Containment Barrel

Features & Benefits

- Guarantees a projectile is never left inside a hose or tube that has been cleaned.
- 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.
- The Ultra Clean Projectile that carries out the cleaning process is verified after it has exited the hose or tube and enters the Containment System.
- Blow air shuts off and Control Station and Containment System lights turn on automatically upon verification.
- The Ultra Clean Projectile is counted by the built-in Projectile Counter.

Air Requirements

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

100% verification that the Ultra Clean Projectile is out of your just-cleaned hose or tube!

Detailed features on page 9 . . .

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.



Barrel Selector Switch, Indicator Lights & Projectile Counter

- Barrel Selector Switch enables use of one or two Containment Barrels.
- Barrel Indicator lights signify firing cycle stage, and which Containment Barrel caught and verified the projectile.

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

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

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

- The Projectile Counter tracks the number of projectiles caught and verified in the Containment System, and counts number of misfires for possible system reset.

24 Volt DC Power Supply & Dual Barrel Hookups

- Power Supply converts 240V AC (Europe) or 110V AC to 24V DC.
- Control Station can accommodate up to two Containment Barrels for production cleaning



Barrel Selector Switch,
Indicator Lights &
Projectile Counter

5 Micron Filter, Regulator
& Gauge



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 is between 80 and 110 PSI maximum.

Keyed Reset for Misfires

- A keyed reset is built into the Control Station. If a misfire occurs, the red Indicator light illuminates. A 1/4 turn of the key resets the Indicator light to green and the system is again ready to fire.



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.



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 11 . . .

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. Special nozzles can be made to suit specific applications. Aluminum, hard coat anodized nozzles are available in hose style from -4 (1/4") through -32 (2").

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.



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.

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.



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.



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.



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.



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-H06 | 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 .035" | UC-T06 | UC10 | UC-A07 | UC06-TUBE |
| 1/4" X .049" | UC-T06 | UC08 | UC-A07 | UC06-TUBE |
| 1/4" X .065" | UC-T06 | UC07 | -- | UC06-TUBE |
| 5/16" X .035" | UC-T08 | UC12 | UC-A10 | UC07-TUBE |
| 3/8" X .035"-.049" | UC-T10 | UC14 | UC-A12 | UC10-TUBE |
| 3/8" X .065" | UC-T10 | UC12 | UC-A10 | UC08-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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E-mail: oilpure@earthlink.net

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

Hose Cleanliness Evaluation Report



Company: **Ultra Clean Technologies Corp.**
 Address: **746 Shiloh Pike**
 City: **Bridgeton** State: **NJ** Zip: **08302**
 Telephone: **1-800-791-9111** Fax: **856-453-4975**
 Contact: **Bruce Riley**
 Title: **President**
 E-mail: **briley@ultracleanotech.com**

Test Date: **September 5, 2006**
 New Oil for Evaluation: **AW46 Hydraulic Oil**
 Hose Type: **-16 1" x 28" oal, 4 spiral hyd hose assembly w 1" Male NPT EE**
 Note:

Dear Bruce

Test Procedure

1. The hose was rinsed with new hydraulic oil several times with non-contact flow technique.
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 a low ISO code 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:4406-99 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.

We hope that this test data will provide sufficient information regarding hose cleanliness evaluation.

Yours sincerely,

Vichai Srimongkolkul
 Technical Director

| Item No. | Hose I.D. | Hose Descriptions | Solid Contamination Particle Count in 1 cc | | | | | | ISO Code |
|----------|-----------|--|--|--------|--------|--------|------|------|--------------|
| | | | 4µ | 6µ | 14µ | 20µ | 30µ | 40µ | |
| 1 | NEW | New AW 46 Hydraulic Oil as base line comparison | 214 | 64 | 23 | 9 | 1 | 0 | 15 / 13 / 12 |
| 2 | A1 | Chop saw with abrasive wheel - no cleaning | 99,999 | 99,999 | 92,618 | 67,576 | 29K | 15K | 24 / 24 / 24 |
| 3 | A2 | Chop saw with abrasive wheel - 10 second air blow | 96,508 | 52,827 | 4,546 | 1,013 | 53 | 13 | 24 / 23 / 19 |
| 4 | A3 | Chop saw with abrasive wheel - Ultra Clean | 1,824 | 511 | 54 | 20 | 2 | 0 | 18 / 16 / 13 |
| 5 | A4 | Chop saw with metal scalloped blade - no cleaning | 99,999 | 99,999 | 54,879 | 29,617 | 6.4K | 2.5K | 24 / 24 / 23 |
| 6 | A5 | Chop saw with metal scalloped blade - 10 second air blow | 99,999 | 84,470 | 18,639 | 5,725 | 752 | 247 | 24 / 24 / 21 |
| 7 | A6 | Chop saw with metal scalloped blade - Ultra Clean | 2,354 | 638 | 73 | 22 | 5 | 1 | 18 / 16 / 13 |

OilPure Technologies, Inc. P.O. Box 483976 • Kansas City • Missouri • 64148 • USA • Tel: 913-906-0400 • Fax: 913-906-9815 • www.oilpure.com

SEAL EASY

Hose, Tube, Pipe & Flange Sealing Systems



Ultra Clean Technologies offers innovative and economical solutions to protect cleaned hoses, tubes and pipes. Our Clean Seal System heat-shrinks a Clean Seal Capsule tightly around the end of a hose assembly. Seal a single hose, or multiple hoses simultaneously! Just sixteen size capsules needed for most jobs. Shorter capsules available to accommodate angle/elbow (ie: 45° and 90°) fittings.

Our second sealing system within the Seal Easy line is Clean Seal Flange, an advanced solution for keeping oil in your system and dirt out whenever you must disconnect or change a hose with flanged connections.

An array of products in the "**Seal Easy**" line includes:

**Clean Seal System
Heat Shrink Guns
Diffusers & Stand
Clean Seal Capsules
Clean Seal Flanges**

Clean Seal System

The Clean Seal System utilizes heat shrink technology to encapsulate the end of a hose or tube assembly with a Clean Seal Capsule. This eliminates possible re-contamination that is problematic with traditional capping and plugging methods. Re-contamination occurs when ill-fitting caps and plugs are forced onto assemblies, causing plastic particles to shear off into the hose or tube. Clean Seal System leaves your assemblies tightly sealed and 100% contamination free, *and* provides an easier, less costly, and more effective solution than traditional capping methods. You'll never have to deal with an excessive cap and plug inventory again.

Features & Benefits

- Preserves cleanliness
- Easy to use heat shrink machine or heat shrink gun for low or high volume production
- Fast and easy capsule installation
- Universal, clean fit up to 3" (80mm)
- Seals straight and elbow couplings - shorter capsules available for angled/ elbow (i.e.: 45° and 90°) fittings
- Eliminates cap inventory hassles



UC-CSC-2023 through UC-CSC-8060 Clean Seal Capsules

Features & Benefits

- Just 16 capsule sizes needed for all assemblies
- Durable and secure
- Quick, clean application
- Blue color for quick and easy identification of sealed hoses
- Easy, clean pull-tab capsule removal
- No particulates or sticky residue left behind



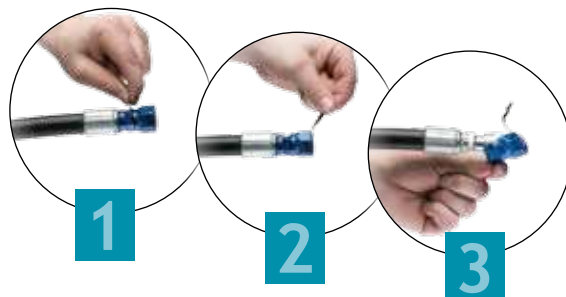
To Apply

1. **Choose** the closest fit capsule and place onto assembly end.
2. **Use** the heat shrink machine or gun to apply heat.

To Remove

1. **Grip** the black pull tab.
2. **Rip** the pull tab upwards.
3. **Slip** the Clean Seal Capsule off the assembly.

Just seconds to apply and remove!



UC-CSS-230V Heat Shrink Machine



Features & Benefits

- Enables sealing of single OR multiple hose or tube assemblies at one time. Great for production sealing!
- Accepts Clean Seal Capsules from 3/4" I.D. (20mm) through 3" I.D. (80mm), allowing for sealing and thread protection of most hose and tube ends from -4 (1/4") through -32 (2").
- White plunger provides solid surface for holding Clean Seal Capsule in place and even heat distribution for a perfect shrink-fit.
- Plunger shelf provides solid surface for holding Clean Seal Capsule in place on angle/elbow (ie: 45° and 90°) fittings.
- Operates on 230V single-phase AC power at 50/60Hz and draws < 10 amps.
- Customer supplies L6-15 NEMA twist loc receptacle.
- When on, ON/Off rocker-style switch illuminates green.
- Hot Air Blower Timer sets in 1-minute increments.
- When on, Timer Light illuminates white.
- 24/7 operating capacity.
- Pre-filtered air prohibits airborne contamination.
- Heat side of machine is fully insulated.
- Internal heat source is brushless and made for industrial applications.

Available Kits (2)

1. **UC-HL-1910HK (pictured):** Hardware-only Kit that includes portable heat shrink gun with case, flexible stand, 95 mm diffuser with 1-1/2" connection.
2. **UC-HL-1910SK:** Hardware & Capsules Starter Kit that includes capsules also available as listed on next page.



Pictured: UC-HL-1910HK

UC-HL1910E Heat Shrink Gun

Features & Benefits

- Variable-temperature electronic heat gun with electronic thermocouple control for flexible use and maximum reliability.
- Duratherm heating element ensures long life and even heat with a temperature range of 120°F (49°C) to 1100°F (593°C) and a built-in cool down switch.
- Operates on 120V AC power, draws 1500 watts, and can produce 17.6CFM.
- Capable of sealing multiple hoses simultaneously.
- Carry Case with various nozzle attachments are included for applications other than shrinking of Clean Seal Capsules.



UC-1.5HD & UC-2.0HD Heat Diffusers

Features & Benefits

- Heat Diffusers enable a 360° even hot air flow to shrink the Clean Seal Capsules.
- Can be installed on heat guns that have a 1 1/2" (38mm) and 2" (50mm) OD on the heating element.
- UC-2.0HD is made of 304 Stainless Steel for a long contamination-free life.
- UC-1.5HD works perfectly with the UC-HL1910 Heat Gun.



UC-HG-STAND

Features & Benefits

- Vacuum pump stand is for hands-free operation of the UC-HL1910E heat gun.
- Adjustable to almost any position.
- Makes your job of shrinking capsules quicker and easier!



Clean Seal System Parts List

HEAT SHRINK SYSTEMS AND ACCESSORIES

| PART NUMBER# | DESCRIPTION |
|---|---|
| HEAT SHRINK MACHINE | |
| UC-CSS-230V | PRODUCTION HEAT SHRINK MACHINE with TIMER |
| HEAT SHRINK GUNS & ACCESSORIES | |
| UC-HL1910E | ELECTRIC HEAT GUN WITH CASE |
| UC-HG-STAND | FLEX VACUUM PUMP STAND |
| UC-1.5HD | 95MM DIFFUSER FOR 1-1/2" CONNECTION |
| UC-2.0HD | 95MM DIFFUSER FOR 2" CONNECTION |
| CLEAN SEAL KITS | |
| UC-HL1910SK (Starter Kit) | PORTABLE HEAT SHRINK GUN WITH CASE (UC-HL-1910E), FLEXIBLE STAND (UC-HG-STAND), 95MM DIFFUSER WITH 1-1/2" CONNECTION (UC-1.5HD) & 1 PACKAGE OF EACH CAPSULE SIZE UC-CSC-2540P, UC-CSC-2840P, UC-CSC-3140P, UC-CSC-3440P, UC-CSC-3840P, UC-CSC-4650P |
| UC-HL1910HK (Hardware Kit) | PORTABLE HEAT SHRINK GUN WITH CASE (UC-HL1910E), FLEXIBLE STAND (UC-HG-STAND), 95 mm DIFFUSER WITH 1-1/2" CONNECTION (UC-1.5HD) |

CLEAN SEAL CAPSULES

| PACKAGED | | BULK | | SIZING | | | *FITTING | |
|--------------------------|------------------------|----------------------|--------------------|--|-------------------------------|-----------------------------------|----------|-------|
| PART NUMBER# PACKAGED | CARTON QTY PACKAGED | PART NUMBER# BULK | CARTON QTY BULK | CAPSULE SIZE Inside Diameter x Length in mm | HEX SIZES COVERED in mm | HEX SIZES COVERED in inches | STRAIGHT | ELBOW |
| UC-CSC-2023P | 1,456 | UC-CSC-2023B | 27,664 | 20 X 23 | 12mm to 18mm | .47" to .71" | | X |
| UC-CSC-2030P | 1,300 | UC-CSC-2030B | 23,400 | 20 X 30 | 12mm to 18mm | .47" to .71" | X | |
| UC-CSC-2224P | 1,500 | UC-CSC-2224B | 27,000 | 22 X 24 | 16mm to 21mm | .63" to .63" | | X |
| UC-CSC-2527P | 1,210 | UC-CSC-2527B | 19,360 | 25 X 27 | 18mm to 23mm | .71 to .91" | | X |
| UC-CSC-2540P | 1,050 | UC-CSC-2540B | 16,800 | 25 X 40 | 18mm to 23mm | .71" to .91" | X | |
| UC-CSC-2840P | 684 | UC-CSC-2840B | 8,892 | 28 X 40 | 22mm to 26mm | .87" to 1.02" | X | |
| UC-CSC-3133P | 918 | UC-CSC-3133B | 11,016 | 31 X 33 | 24mm to 29mm | .94" to 1.14" | | X |
| UC-CSC-3140P | 850 | UC-CSC-3140B | 10,200 | 31 X 40 | 24mm to 29mm | .95" to 1.14" | X | |
| UC-CSC-3440P | 560 | UC-CSC-3440B | 13,440 | 34 X 40 | 27mm to 32mm | 1.07" to 1.26" | X | |
| UC-CSC-3840P | 756 | UC-CSC-3840B | 7,560 | 38 X 40 | 30mm to 36mm | 1.19" to 1.42" | X | X |
| UC-CSC-4345P | 546 | UC-CSC-4345B | 4,368 | 43 X 45 | 32mm to 41mm | 1.26" to 1.61" | X | X |
| UC-CSC-4650P | 540 | UC-CSC-4650B | 4,320 | 46 X 50 | 34mm to 44mm | 1.34" to 1.73" | X | X |
| UC-CSC-5260P | 520 | UC-CSC-5260B | 3,640 | 52 X 60 | 41mm to 50mm | 1.62" to 1.97" | X | X |
| UC-CSC-5860P | 585 | UC-CSC-5860B | 3,510 | 58 X 60 | 49mm to 56mm | 1.93" to 2.20" | X | X |
| UC-CSC-6760P | 400 | UC-CSC-6760B | 3,200 | 67 X 60 | 55mm to 65mm | 2.16" to 2.56" | X | X |
| UC-CSC-8060P | 434 | UC-CSC-8060B | 1,736 | 80 X 60 | 64mm to 78mm | 2.52" to 3.07" | X | X |

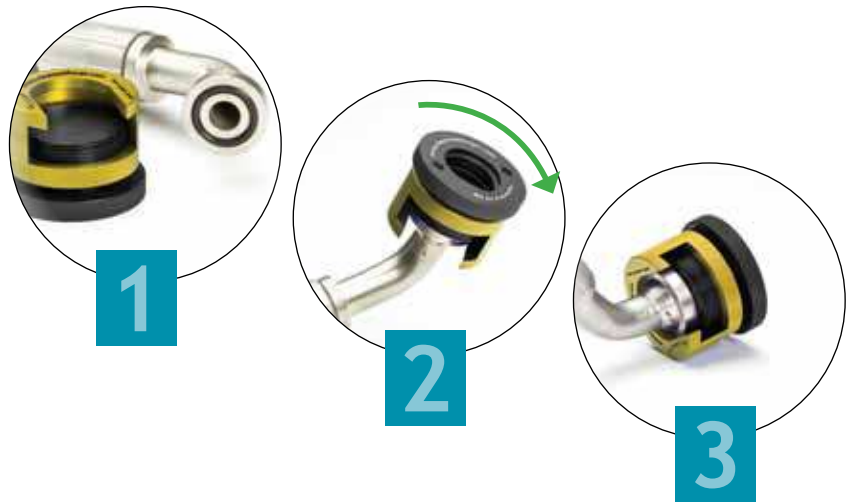
*Shorter length capsules are recommended for elbow/angled fittings (i.e. 45° and 90°).

Clean Seal Flange

The Clean Seal Flange is a tool that easily attaches to SAE flanges to prevent dirt and other contaminants from entering hydraulic hoses when switching out or removing components such as pumps, cylinders or valves from heavy duty equipment, particularly in the field. Once the change is complete, the Clean Seal Flange is removed and normal operation is resumed. No tools are needed to connect or remove the Clean Seal Flange! Designed with the environment in mind, Clean Seal Flange also prevents oil and contaminants from spilling out and polluting surrounding soil and water.

Features & Benefits

- Keeps oil in and dirt out!
- Seal hydraulic flanges fast and easy
- Durable anodized aluminum construction
- Easy on/off, no tools required
- 2 spare O-rings provided in each Clean Seal Flange
- Eliminates flange capping hassles
- No drips, leaks or spills
- Ensures cleanliness
- Universal fit for Code 61-62, CAT and Komatsu flanges
- 7 color coded sizes -8 through -32



UC-CSF-8 through UC-CSF-32 Clean Seal Flanges & Kits



| COLOR CODE CHART | | | |
|------------------|--------------|-------------|--------------|
| DASH | Nominal INCH | PART NUMBER | COLOR |
| -8 | 1/2" | UC-CSF-8 | SILVER/BLACK |
| -10 | 5/8" | UC-CSF-10 | RED/BLACK |
| -12 | 3/4" | UC-CSF-12 | BLUE/BLACK |
| -16 | 1" | UC-CSF-16 | GREEN/BLACK |
| -20 | 1-1/4" | UC-CSF-20 | GOLD/BLACK |
| -24 | 1-1/2" | UC-CSF-24 | ORANGE/BLACK |
| -32 | 2" | UC-CSF-32 | BLACK/BLACK |

UC-CSF-POPD: POP Display includes: Display Box, Graphics, Foam Insert

UC-CSF-AC: Carry/Sales Case includes: Aluminum Case, Foam Insert

Both items above include the following Clean Seal Flanges:

2 each UC-CSF-8, UC-CSF-10, UC-CSF-24, UC-CSF-32; 4 each UC-CSF-12, UC-CSF-16, UC-CSF-20

BREATHE EASY

Air Purification Products



Ultra Clean Technologies offers a line of desiccant breathers designed to remove corrosive water vapor, dirt, grime, and other contaminants from the intake systems of virtually all industrial equipment, allowing in only clean, dry air. Desiccant breathers help keep both systems and fluids in peak condition.

Products in the "***Breathe Easy***" line includes:

Desiccant Breathers

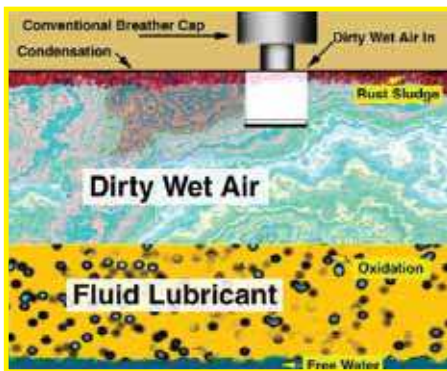
Breathe Easy with Ultra Clean!

For UC-D1 Super-Dry Compressed Air Dryer, see page 12.

Desiccant Breathers

Features & Benefits

- Ultra Clean Desiccant Breathers are a unique, patented air filter and vapor removal system. They replace the standard breather or vent cap on virtually all types of industrial equipment, storage tanks, and transformers.
- The Desiccant Breather removes corrosive water vapor and destructive contaminants from entering fluid reservoirs and tanks as air is breathed in and out due to thermal expansion or fluid level changes.
- Fluid contamination is one of the primary causes of component wear and lubricant failure in industrial equipment.
- Models are available to meet the requirements of most industrial applications.



Why Use Ultra Clean Breathers?

- When the fluid in the system is lowered or pressure changes occur, air is drawn into the system through the openings under the breather cap. As the air is sucked in, a significant amount of water, dirt, and grime is introduced into your equipment.
- These contaminants pollute the system, causing the machinery to slow down or fail altogether. The Ultra Clean breather is designed to capture and eliminate these contaminants, and allow only clean, dry air into your system.

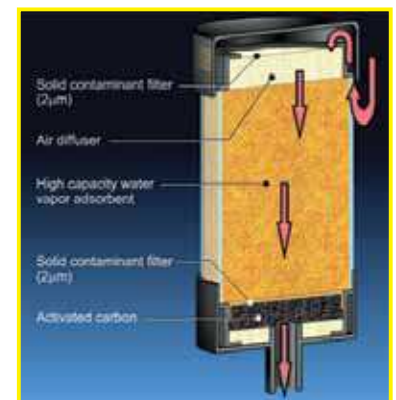
Illustration shows what a reservoir without an Ultra Clean Desiccant Breather looks like.

How it Works

- As air enters the breather, it passes through a fine, 2-micron solid particle filter. The air then passes through a diffuser to ensure maximum effectiveness within the silica gel chamber.
- Next, water vapor is removed as the air travels through a bed of silica gel – the highest capacity adsorbent available. After being dried, the air passes through a second 2-micron solid particle filter and enters the reservoir – clean and dry!

As air is drawn into the system it is forced through a 2-micron filter, diffuser, water adsorbent silica gels, and another 2-micron filter! The result? CLEAN AIR!

Color Indicator



Operational Features

- **Bi-Directional Air Flow:** Air entering is cleaned and dried. Expelled air partially regenerates the silica gel and “backflushes” the particulate filter to prolong the life of the breather.
- **Water Vapor Adsorbent:** The silica gel used is chemically inert, non-corrosive, and conforms to all regulated toxicity standards in the U.S. and other countries. Microscopic pores allow the silica to adsorb up to 40% its own weight.
- **Color Indicator:** When maximum adsorption is reached, the silica turns from gold to dark green to indicate that replacement of the breather is required.
- **Activated Carbon:** As air is expelled from the tank, it passes through activated carbon which removes oil vapors, fumes, and odors.
- **Durable Construction:** Our breathers are manufactured from rugged ABS plastic and impact-modified Plexiglass.
- **Safety Sealed:** Seals keep moisture from entering the units until they are placed in service. They are easily removed without tools or sharp instruments.

D-Series Breathers



- Feature seven different models.
- Designed to satisfy the requirements of most stationary applications involving hydraulic reservoirs, lubricant and fuel storage tanks, transformers, pumps and gearboxes.
- Provide application flexibility by using 100% silica gel for moisture absorption or 100% activated carbon for fume or odor control, or a mixture of both when necessary.
- All D-Series models feature 2 micron solid particle filtration and are available with airflow ratings of 35 cfm to 250 cfm.

R-Series Breathers



- R-Series breathers are suitable for high vibration applications including off-road vehicles, construction vehicles, haul trucks, and farm vehicles typically equipped with hydraulic fluid reservoirs.
- R-Series breathers are easily mounted in place of standard breather caps via rugged steel pipe threads, included with all models except the R-111.
- The metal reinforced base is reusable.
- When the silica gel cartridge turns color from gold to dark green, simply install a new replacement cartridge onto the reusable metal base.
- The R-Series rebuildable design allows for economical replacement of the desiccant cartridge.



Z-Series Breathers

- Z-Series breathers are designed for applications where space is limited or air flow requirements are below 10 cubic feet per minute (cfm).
- The Z-Series breather is typically used on gearbox applications and has been proven to work well on low fluid volume applications where mounting space is limited or where a larger breather won't fit without remote mounting.

Most mobile equipment, including maintenance of way equipment, farm implements, and off-road vehicles, are equipped with hydraulic fluid tanks or reservoirs which breathe outside air.

**Controlling contamination is
always less than the cost of repair!**

X-Series Breathers



- Perfect for high humidity, high dust environments.
- Incorporates two check valves. The intake check valve allows airflow into the breather only when differential pressure between the atmosphere and reservoir exceeds a 0.3 PSI threshold.
- The exhaust check valve permits air to exit the reservoir when the differential pressure between the reservoir and atmosphere exceeds a 2.1 PSI threshold, providing a closed system until air flow is required.
- The check valves extend desiccant life by allowing the air flow through the breather only when needed to protect tank integrity.
- With a rugged design, X-Series breathers include a top cap to be reused when the desiccant is spent. When the silica gel turns dark green, remove the reusable top cap from the bottom desiccant cartridge, then use the same top cap with a replacement cartridge.
- Rebuildable design for economical replacement of desiccant cartridge.

XR-Series Breathers



- XR-Series breathers are designed for extreme environment applications where protection from dust, moisture and vibration are critical.
- XR-Series breathers include a metal reinforced base available with male NPT threads to adapt to your equipment.
- The base is designed to handle the rigors of high vibration applications.
- The top cap implements two check valves to prevent outside moisture and solid contaminants from entering the breather until there is a need for airflow.
- The XR-Series rebuildable design allows for economical replacement of the desiccant cartridge.

M-Series Breathers

- M-Series breathers are designed from heavy duty materials capable of handling the requirements of the most severe environments.
- Replaces the standard breather cap or vent tube on tanks and reservoirs. Pipe threads on the bottom standpipe make this unit easy to install.
- All M-Series designs have 2 micron pleated filters and silica gel bags that are easily replaced.
- The M-Series design features our proprietary Splash Guard. This device is included in all M-Series models and prevents foaming or splashing fluids from entering the breather during normal operating conditions.



Standard Breather Specifications

| Model | Height in. (cm) | Diameter in. (cm) | Mounting Connection | Weight lbs. (kg) | Water Capacity fl.oz (mL) | Maximum Airflow cfm | Maximum Reservoir Fluid Flow gpm | Type of Medium |
|--------------------------------|-----------------|-------------------|----------------------|------------------|---------------------------|---------------------|----------------------------------|-----------------|
| D-SERIES DESICCANT | | | | | | | | |
| UC-D100 | 3.5 (8.9) | 5 (12.7) | 1" slip fit | 1.5 (0.7) | 3.1 (92) | 20 | 150 | 100% Silica Gel |
| UC-D101 | 5 (12.7) | 5 (12.7) | 1" slip fit | 2.2 (1.0) | 6.2 (183) | 20 | 150 | 100% Silica Gel |
| UC-D102 | 8 (20.3) | 5 (12.7) | 1" slip fit | 3.6 (1.6) | 13.9 (411) | 20 | 150 | 100% Silica Gel |
| UC-D103 | 8 (20.3) | 5 (12.7) | 1" male NPT | 3.6 (1.6) | 13.9 (411) | 20 | 150 | 100% Silica Gel |
| UC-D104 | 8 (20.3) | 5 (12.7) | 2" male NPT | 3.6 (1.6) | 13.9 (411) | 20 | 150 | 100% Silica Gel |
| UC-D108 | 10 (25.4) | 5 (12.7) | 2" male NPT | 4.8 (2.2) | 18.5 (547) | 20 | 150 | 100% Silica Gel |
| UC-D109 | 14 (35.6) | 6 (15.2) | 3" male NPT | 6.1 (2.8) | 18.5 (547) | 20 | 150 | 100% Silica Gel |
| Z-SERIES MINI DESICCANT | | | | | | | | |
| UC-Z131 | 2 (.51) | 2 (.51) | 1/2" female NPT | 0.15 (68) | 0.5 (15) | 5 | 37 | 100% Silica Gel |
| UC-Z132 | 3.25 (8.3) | 2 (.51) | 1/2" female NPT | 0.2 (91) | 0.9 (27) | 5 | 37 | 100% Silica Gel |
| UC-Z133 | 2 (.51) | 3.25 (8.3) | 1/2" female NPT | 0.5 (227) | 1.6 (47) | 5 | 37 | 100% Silica Gel |
| UC-Z134 | 3.25 (8.3) | 3.25 (8.3) | 1/2" female NPT | 0.8 (363) | 2.8 (83) | 5 | 37 | 100% Silica Gel |
| UC-Z135 | 5.5 (14.0) | 3.25 (8.3) | 1/2" female NPT | 1.2 (544) | 2.0 (59) | 5 | 37 | 100% Silica Gel |
| M-SERIES STEEL DESICCANT | | | | | | | | |
| UC-M103 | 6.6 (16.8) | 10 (25.4) | 1" male NPT | 8.4 (3.8) | 12 (355) | 35 | 262 | 100% Silica Gel |
| UC-M104 | 6.6 (16.8) | 10 (25.4) | 2" male NPT | 9 (4.1) | 12 (355) | 120 | 900 | 100% Silica Gel |
| UC-M105 | 12 (30.5) | 10 (25.4) | 1" male NPT | 14 (6.4) | 26 (770) | 35 | 262 | 100% Silica Gel |
| UC-M106 | 12 (30.5) | 10 (25.4) | 2" male NPT | 16 (7.3) | 26 (770) | 120 | 900 | 100% Silica Gel |
| UC-M107 | 13.5 (34.3) | 16 (40.6) | 3" male NPT | 41.5 (18.9) | 128 (3785) | 300 | 2250 | 100% Silica Gel |
| R-SERIES REBUILDABLE DESICCANT | | | | | | | | |
| UC-R100 | 5 (12.7) | 5.2 (13.2) | 1" male NPT | 2.5 (1.1) | 3.1 (91) | 25 | 187 | 100% Silica Gel |
| UC-R101 | 6.5 (16.5) | 5.2 (13.2) | 1" male NPT | 3.2 (1.5) | 6.2 (183) | 25 | 187 | 100% Silica Gel |
| UC-R102 | 9.5 (24.1) | 5.2 (13.2) | 1" male NPT | 4.5 (2.0) | 13.9 (411) | 25 | 187 | 100% Silica Gel |
| UC-R111* | 6 (15.2) | 5.2 (13.2) | 1.125" female thread | 2.8 (1.3) | 6.2 (183) | 25 | 187 | 100% Silica Gel |
| UC-R123 | 12 (30.5) | 5.2 (13.2) | 2" male NPT | 5.5 (2.5) | 18.5 (547) | 25 | 187 | 100% Silica Gel |
| X-SERIES EXREME HUMIDITY | | | | | | | | |
| UC-X100 | 6.25 (15.9) | 3.25 (8.3) | 1/2" female NPT | 2.5 (1.1) | 2.0 (59) | 10 | 75 | 100% Silica Gel |
| UC-X101 | 7 (17.8) | 5 (12.7) | 1" slip fit | 3.3 (1.5) | 6.2 (183) | 20 | 150 | 100% Silica Gel |
| UC-X102 | 10 (25.4) | 5 (12.7) | 1" slip fit | 4.8 (2.2) | 13.9 (411) | 20 | 150 | 100% Silica Gel |
| UC-X121 | 7 (17.8) | 5 (12.7) | 2" male NPT | 3.3 (1.5) | 6.2 (183) | 20 | 150 | 100% Silica Gel |
| UC-X122 | 10 (25.4) | 5 (12.7) | 2" male NPT | 5 (2.3) | 13.9 (411) | 20 | 150 | 100% Silica Gel |
| XR-SERIES | | | | | | | | |
| UC-XR101 | 8.5 (21.6) | 5.2 (13.2) | 1" male NPT | 9.00 (4.1) | 6.2 (183) | 25 | 187 | 100% Silica Gel |
| UC-XR102 | 11.5 (29.2) | 5.2 (13.2) | 1" male NPT | 10.5 (10.5) | 13.9 (411) | 25 | 187 | 100% Silica Gel |
| UC-XR108 | 14 (35.6) | 5.2 (13.2) | 2" male NPT | 12.5 (5.7) | 18.5 (547) | 25 | 187 | 100% Silica Gel |

* The R-111 is used in conjunction with the A-306 pressure relief valve, which has a 1.125 inch male thread to mount to the fluid reservoir.

Standard Breather Replacements

| Model Number | Replacement Silica Gel Bag # | Weight of Silica Gel Bag lbs. (kg) | Replacement Polyester Pleated Filter # | Filter Weight lbs. (kg) |
|---|------------------------------|------------------------------------|--|-------------------------|
| M-SERIES REPLACEMENT FILTERS AND GEL | | | | |
| UC-M103 | 095A201 | 3.1 (1.4) | 095A204 | 2.0 (0.9) |
| UC-M104 | 095A201 | 3.1 (1.4) | 095A204 | 2.0 (0.9) |
| UC-M105 | 095A202 | 4.0 (1.8) | 095A205 | 3.0 (1.4) |
| UC-M106 | 095A202 | 4.0 (1.8) | 095A205 | 3.0 (1.4) |
| UC-M107 | 095A203 | 18.0 (8.2) | 095A206 | 5.0 (2.3) |

| Model | Height in. (cm) | Diameter in. (cm) | Replacement Cartridge for Model | Weight lbs. (kg) | Water Capacity fl.oz (mL) | Maximum Airflow cfm | Maximum Reservoir Fluid Flow gpm | Type of Medium |
|--|-----------------|-------------------|---------------------------------|------------------|---------------------------|---------------------|----------------------------------|----------------|
| R-SERIES REPLACEMENT CARTRIDGES | | | | | | | | |
| UC-C300 | 3.75 | 5 (12.7) | R-100 | 1.8 (0.8) | 3.1 (91) | 25 | 187 | Silica Gel |
| UC-C301 | 5 (12.7) | 5 (12.7) | R-101 or R-111 | 2 (0.9) | 6.2 (183) | 25 | 187 | Silica Gel |
| UC-C302 | 8 (20.3) | 5 (12.7) | R-102 | 3.3 (1.5) | 13.9 (411) | 25 | 187 | Silica Gel |
| UC-C323 | 10 (25.4) | 5 (12.7) | R-123 | 4.6 (2.1) | 18.5 (547) | 25 | 187 | Silica Gel |

| Model | Height in. (cm) | Diameter in. (cm) | Mounting Connection | Weight lbs. (kg) | Water Capacity fl.oz (mL) | Maximum Airflow cfm | Maximum Reservoir Fluid Flow gpm | Replacement for Model | Type of Medium |
|--|-----------------|-------------------|---------------------|------------------|---------------------------|---------------------|----------------------------------|-----------------------|-----------------|
| X-SERIES REPLACEMENT CARTRIDGES | | | | | | | | | |
| UC-C143 | 3.25 | 5 (12.7) | 1/2" female NPT | 1.2 (.5) | 2.0 (59) | 10 | 75 | UC-X100 | 100% Silica Gel |
| UC-C341 | 5 (12.7) | 5 (12.7) | 1" slip fit | 2.3 (1.0) | 6.2 (183) | 20 | 150 | UC-X101 | 100% Silica Gel |
| UC-C342 | 5 (12.7) | 5 (12.7) | 1" slip fit | 3.6 (1.6) | 13.9 (411) | 20 | 150 | UC-X102 | 100% Silica Gel |
| UC-C343 | 5 (12.7) | 5 (12.7) | 2" male NPT | 2.4 (1.1) | 6.2 (183) | 20 | 150 | UC-X121 | 100% Silica Gel |
| UC-C344 | 5 (12.7) | 5 (12.7) | 2" male NPT | 3.7 (1.7) | 13.9 (411) | 20 | 150 | UC-X122 | 100% Silica Gel |

| Model | Height in. (cm) | Diameter in. (cm) | Weight lbs. (kg) | Water Capacity fl.oz (mL) | Maximum Airflow cfm | Maximum Reservoir Fluid Flow gpm | Type of Medium |
|---|-----------------|-------------------|------------------|---------------------------|---------------------|----------------------------------|-----------------|
| XR-SERIES REPLACEMENT CARTRIDGES | | | | | | | |
| UC-C351 | 5 (12.7) | 5 (12.7) | 2.2 (1.0) | 6.2 (183) | 25 | 187 | 100% Silica Gel |
| UC-C352 | 8 (20.3) | 5 (12.7) | 3.6 (1.6) | 13.9 (411) | 25 | 187 | 100% Silica Gel |
| UC-C358 | 10 (25.4) | 5 (12.7) | 4.8 (2.2) | 18.5 (547) | 25 | 187 | 100% Silica Gel |

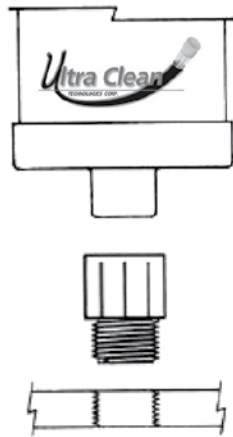
Applications for Desiccant Breathers

Adapter Selection Guide

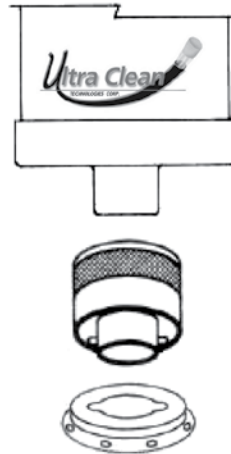


Flange Adapter
Model UC-AD101
(without mounting holes)

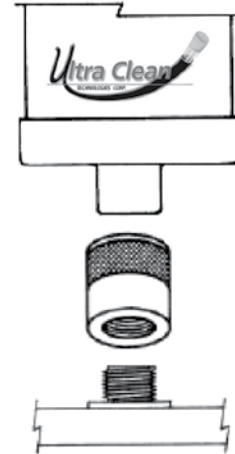
Model UC-AD114
(with 6 mounting holes)



Threaded Adapter
Model UC-AD102 (1" MNPT)
Model UC-AD103 (¾" MNPT)



Bayonet Adapter
Model UC-AD104



Spin-on Adapter
Model UC-AD105 (1" - 12 UNF)
Model UC-AD106 (1½" - 16 UN)





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