

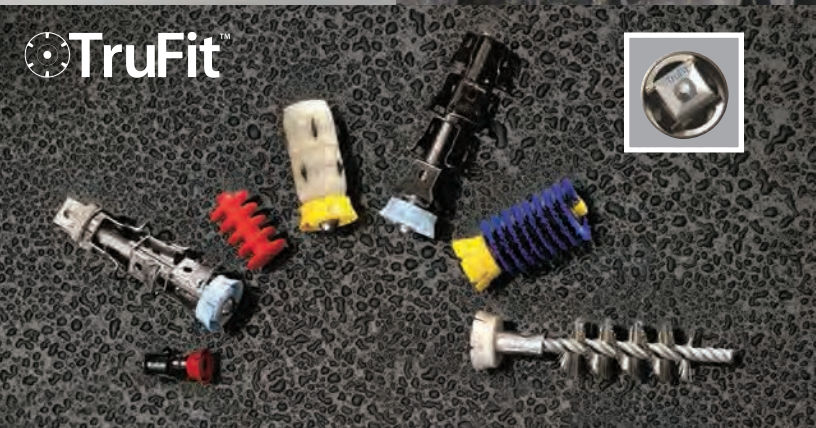
# 2015

**Condenser and Heat Exchanger  
Tube Cleaning**

**Air-Cooled Condenser Cleaning**

**Eddy Current and  
Remote Field Testing**

**Tracer Gas Leak Detection**







### Rotary Air Heater

Conco's NitroLance cleaning system uses pressurized liquid nitrogen to power off tough deposits found in rotary air heaters, steam coil air heaters, economizers and superheaters all without producing a drop of wastewater.



### Heat Exchangers

Conco provides specialized shell and tube heat exchanger cleaning and testing services worldwide. Our heat exchanger cleaning technologies range from our patented TruFit tube cleaners to our NitroLance liquid nitrogen system. Whether you are in charge of a power plant, refinery, petrochemical plant or even a large marine vessel, Conco can effectively and economically return your heat exchanger to peak performance.



### Leaks

In a Rankine cycle, the high-pressure steam or liquid follows a closed loop and is reused constantly. Leaks in the condenser can allow contaminants and fouling from the cooling water to seep into the system, and can damage the boiler and turbine.



### Surface Condenser

Our exclusive ProSeries tube cleaning systems allow our crews to effectively clean more tubes per shift than high-pressure water jetting or chemical cleaning, and at a significantly lower overall cost. Our tube cleaning services are backed by 90 years of know-how and a full line of TruFit tube cleaners that can tackle anything you throw their way. Whether your condenser is fouled with silt, sediment, sea-life or scale, Conco has the expertise to quickly return it to peak performance.



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## Solutions for Every Application

Conco's services work together to provide the best possible result through every step of the Rankine Cycle. Our Total Performance program offers cleaning and maintenance solutions for rotary air heaters, turbines, condensers and heat exchangers.



### Turbine

Defects and wear in turbine shaft packing and seals can result in air leakage, which detrimentally affects heat rate and limits generation capacity. Excessive air in-leakage can even result in corrosion damage throughout the unit. Conco's Leak Detection survey starts at the turbine deck level and tests all unit components within the vacuum boundary.



### Air-Cooled Condenser

Keeping the finned surfaces of an air-cooled condenser or fin-fan unit clean is imperative to maintaining optimal performance. Units fouled with dust, dirt, debris, pollen, leaves and other deposits can decrease output.

Utilizing the latest in precision high-pressure water jetting technology, Conco's FinTech ACC cleaning service has been used in hundreds of power plants worldwide.



### Cooling Water

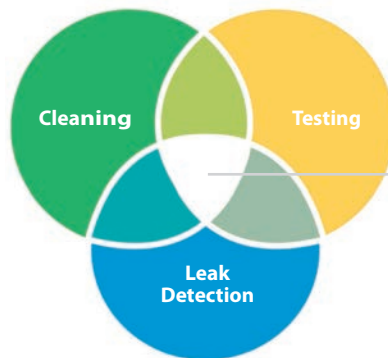
Cooling water for condensers and heat exchangers typically originates from ponds, rivers or lakes, and may contain natural sediment, debris and biomass. These travel through the tubes and eventually become stuck. This fouling can build up inside the tubes and on the tubesheet and negatively affect performance.

**Conco's Distribution Network Is Worldwide**  
See Back Cover for Contact Information



# Total Performance™

The Perfect Balance of Productivity, Reliability and Profitability



### Productivity

Clean condenser and heat exchanger tubes lead to improved and more effective flow and heat transfer rate, increasing overall megawatt output. Clean tubes can increase efficiency by as much as 4%.

### Reliability

Impurities and leaks lead to unscheduled downtime. Tube inspection makes plant more dependable, identifying equipment fatigue and corrosion before they force unplanned outages.

### Profitability

When your plant is reliable and productive, efficient energy production is high and maintenance costs are low, improving your bottom line and increasing your profits.



### ProSeries™ Tube Cleaning

Our exclusive Pro Series tube cleaning system allows crews to effectively clean more tubes per shift than high-pressure water or chemical cleaning at a significantly lower cost. Our tube cleaning services are backed by 90 years of experience and a full line of our patented TruFit™ tube cleaners, uniquely designed for specific fouling and customized for a perfect fit.



### Excaliber™ Flex Drive and HydroDrill™ Rotary Tube Cleaning

Both the Excaliber and HydroDrills incorporate rotary-cleaning and water-flushing actions to remove heavy wall deposits and fouling in condensers and heat exchangers. The Excaliber features a powerful 5.25 HP motor to drive a flexible shaft at speeds up to 2,500 RPM, powering off deposits and flushing tubes clean in a single, efficient operation. HydroDrill units use a rigid shaft rotating at 1,000 to 2,000 RPMs and 2 to 3 GPM of water at 200 to 300 PSI to remove hard deposits from tubes.



### FinTech Air-Cooled Condenser Cleaning

Designed to clean air-cooled condensers, our FinTech ACC™ method has restored performance to units fouled with dust, dirt, debris, pollen, leaves and insects. At the heart of the FinTech ACC system is a computer-controlled 12-nozzle water jet assembly traveling on tracks, ensuring a consistent clean from start to finish.



### NitroLance™ Liquid Nitrogen Cleaning

NitroLance is a highly effective and innovative solution for removing the most tenacious deposits. Harnessing the power of liquid nitrogen, the NitroLance removes difficult deposits quickly and safely without producing secondary waste or cross-contamination.



### Non-Destructive Testing

Conco's staff of certified analysts and technicians offer comprehensive tube inspection services, utilizing state-of-the-art testing technology. Experienced with Eddy Current, Remote Field and Near Field Testing, Conco is recognized as an industry expert on tube failure prevention.



### Deposit and Tube Failure Analysis

Knowing what type of deposits are in your tubes and how they affect tube integrity can help you win the war on tube fouling and failure. Once a sample is collected, it is sent to Conco's lab for analysis where the deposit's key elements and organic content are identified, and a full report is made. You can then make the necessary adjustments to your cooling water chemistry to reduce the impact of future deposits.



### Tube Leakage Detection

Leaks in condenser tubes can result in contaminants and fouling flowing out of control through your system. Contaminants can change condensate chemistry, causing corrosion and cracking in the boiler, turbine or steam generator. Our crews work methodically and utilize ultra-sensitive SF<sub>6</sub> tracer gas and helium to find even the smallest leaks.



### Air Inleakage Detection

Conco developed the industry standards for air inleakage at power plants and provides more leak detection inspections to power customers than any other company. Our technicians' years of specialized technical expertise means they can reliably locate inleakage fast.



### Plugging

When your condenser or heat exchanger tubes need to be plugged, you can count on Conco to get the job done right. We offer a wide range of plugs to match any application. Conco crews are experts in plugging. In addition to providing the know-how, our staff can work with you to determine the appropriate tube plugs best suited for your project.





Welcome to the World of Conco!

Here at Conco we have been designing and manufacturing tube cleaning tools for over 90 years. In that time our goal has never changed. Conco's aim is to be the manufacturer of the highest quality, best performing tube cleaning systems in the world. Only by using absolutely the best equipment can our service crews provide you the comprehensive unparalleled results in the safest, most effective and efficient way possible.

Our TruFit™ tube cleaners have been proven to be the safest, quickest, most effective tools in the world over and over again. Whether you need to clean tens of thousands of tubes in power plant surface condensers or hundreds of tubes in refinery and chemical plant process heat exchangers, Conco is the answer for your tube cleaning needs.

Conco's equipment is the safest. At less than 600 psi and 36 gallons per minute water propulsion, our cleaners exit the tubes at a safe, low-energy state. That means there is no longer a need for large roped off safety zones around the heat exchanger.

Requiring a foot print of only 100 to 200 square feet means many heat exchangers can be cleaned in place and the equipment can be placed close to the unit being cleaned to enhance safety and oversight.

Our cleaning systems are designed to be the most effective, worldwide. Our brushes have more and better bristles, our metal tube cleaners cover and more closely fit the radii of the tubes and our rotating equipment is designed to be much more robust than any other on the market today.

Our service crews are trained to the highest safety standards. They receive many hours of hands-on instruction in a variety of product applications and cleaning situations. Our security checks and screening programs exceed all industry standards and can be adjusted and updated to fill any custom standard your facility may require.

So call today, and enjoy the benefits of our 90+ years' experience and understanding of the operations of your facility... Quick, safe, effective tube cleaning, what Conco is all about!

Be Safe,

*Ed Saxton*

Chief Executive Officer

# Total Performance™

## For Condensers and Heat Exchangers

### Productivity, Reliability and Profitability

At Conco, we believe achieving Total Performance, the perfect balance of productivity, reliability and profitability, is attainable through a unique integration of cleaning, non-destructive testing and leak detection.

With Total Performance you can anticipate problems and keep your condenser tubes at optimum efficiency. The three-part process identifies the status of condenser tubes, detects equipment fatigue that can cause inefficiency, and cleans the tubes to improve flow and heat transfer. Together, Conco's Total Performance platform can increase efficiency by as much as 4%.



Tube Cleaning



Non-Destructive Testing



Leak Detection



ACC Fin-Fan Cleaning



Deposit Analysis



Plugging

### Cleaning Services

Tube Shooting .....	2 to 4
Rotary Tube Cleaning .....	5
Air Cooled Condenser Cleaning .....	6 to 7
Liquid Nitrogen Cleaning .....	8 to 9

### Testing Services

Non-Destructive Testing .....	10 to 11
Deposit and Tube Failure Analysis .....	12 to 13

### Leak Detection Services

Tracer Gas Testing .....	14 to 15
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### Plugging Services

Tube Plugging .....	16
---------------------	----

### Tube Cleaning Equipment

ProSeries™ 200B Tube Cleaning System .....	18 to 19
TruFit™ Tube Cleaners .....	20 to 23
Excaliber™ Flex Drive Tube Cleaning System .....	24 to 25
HydroDrill™ Rotary Tube Cleaning Systems .....	26 to 27

### Leak Detection Equipment

Fluorotracer™ System .....	28 to 29
Helium Mass Spectrometer System .....	28 to 29

### Tube Inserts and Plugs

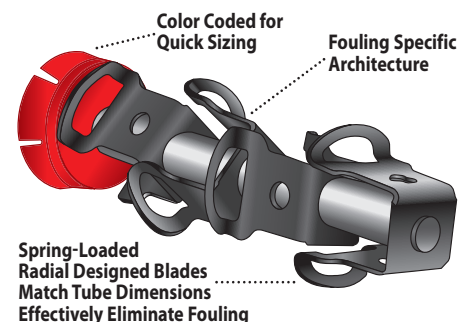
Alkaserts® Polyethylene Inserts .....	30
Tube Plugs .....	31

### Quick Reference Guides

English and Metric Tube Size Guides .....	32
Tube Cleaner Selection Guide .....	IBC



Conco TruFit Tube Cleaners are custom made to match your exact tube dimensions. We offer not just one or two, but over a dozen different styles and configurations to thoroughly remove any deposit from any tube. Call today and ask how you can get a free sample of the Conco TruFit Tube Cleaner that is right for you.







# CONCO SERVICES

**CLEANING • NON-DESTRUCTIVE TESTING • LEAK DETECTION • PLUGGING**

## Over 150 Million Tubes Cleaned and Counting

For over 90 years Conco has designed and developed condenser and heat exchanger tube cleaners that have set the industry standards. Our tube cleaners feature TruFit™ technology, a system that uses custom sized tube cleaners propelled by safe 300 PSI water pressure to give tubes an exceptional clean. In addition to our exclusive line of tube cleaners and plugs, we have developed tracer gas leak detection technology and fully integrated our non-destructive testing services. We have introduced new methods for cleaning air-cooled condensers as well as HydroDrill™ services for removing the most difficult deposits. We even pioneered the use of liquid nitrogen as a cleaning agent with our NitroLance™ cleaning service. These developments along with our many success stories have positioned Conco as the undisputed world leader in condenser and heat exchanger tube cleaning and maintenance.





# TUBE CLEANING SERVICES

**With 90 plus years of experience and over 150 million tubes cleaned Conco is the leader in condenser and heat exchanger tube maintenance!**

Since 1923, Conco has been providing tube cleaning services for major power generation companies, worldwide. Today, Conco crews can be found cleaning tubes in facilities of all sizes and configurations including large nuclear and fossil fuel plants, petrochemical and refining companies and industrial facilities.

Conco's exclusive technology allows our crews to effectively clean more tubes per shift than high-pressure water jetting or chemical cleaning and at a significantly lower overall cost. Our tube cleaning services are backed by over 90 years of experience and feature a full line of TruFit™ tube cleaners that can tackle anything you can throw their way. Whether your condenser or heat exchanger is fouled with silt, sediment, sea life or scale, Conco has

the field-proven expertise to quickly and efficiently return it to optimal performance.

Regardless of your plant's size or output, Conco tube cleaning services will help you run more efficiently, improving system reliability and production. You will experience improved heat rate, increased output, improved condenser and heat exchanger performance and reduced CO<sub>2</sub> emissions.



## Fast and Effective

Conco tube cleaning services minimize down time. Our crews clean an average of 5,000 tubes per shift, returning your unit to service in the briefest time possible. A large selection of Conco TruFit tube cleaners, as well as rotary brushing and drilling technologies are available, designed to suit site-specific deposit conditions and assure immediate removal of:

- Fouling Deposits
- Corrosion Products
- Physical Obstructions
- Tube Surface Roughness

Conco is experienced in providing tube cleaning services for all types of heat exchangers including:

- Condensers
- Heat Exchangers
- Service Water Heat Exchangers
- Feedwater Heaters
- Oil Coolers
- Sulfur Recovery Units
- Re-boilers
- Chemical Reactors

## Available 24-7

Conco crews, are available 24 hours a day, 7 days a week, 365 days a year for routine maintenance or emergency situations. Our response time is second to none. We can deliver a Conco crew, complete with a supervisor, to your site within 24 hours. During emergency outages, multiple crews can be added to expedite work.

## Full Service Operation

Conco's service does not stop with tube cleaning. Service options include analysis reports with deposit weight and density, loss of ignition, and elemental analysis by X-Ray Fluorescence. In addition to superior tube cleaning and analysis services, our crews can provide:

- Non-Destructive Testing
- Tracer Gas Leak Detection
- High Confidence Tube Plugging

## Cleaning at Reduced Load

Whether your plant is down for an outage, turnaround or operating at reduced load, Conco crews have the ability to clean your condensers and heat exchangers. Cleaning the tubes at reduced load during periods of peak demand often results in immediate return-on-investment and optimal output during peak revenue generating periods.

## Expert Staffing

Professional, quality-oriented and self-sufficient are just a few words that describe the Conco crews. They are fully certified in confined space, CPR, safety and first aid. All of our technicians are TWIC (Transportation Worker Identification Credentials) card carriers, issued by the US government. TWIC card carriers are pre screened by the US Government for security clearance and access to refining and petrochemical facilities. They have also completed OSHA (Occupational Safety and Health Administration) training, Basic Plus refining training along with logging all site specific training.

## Conco Supervision

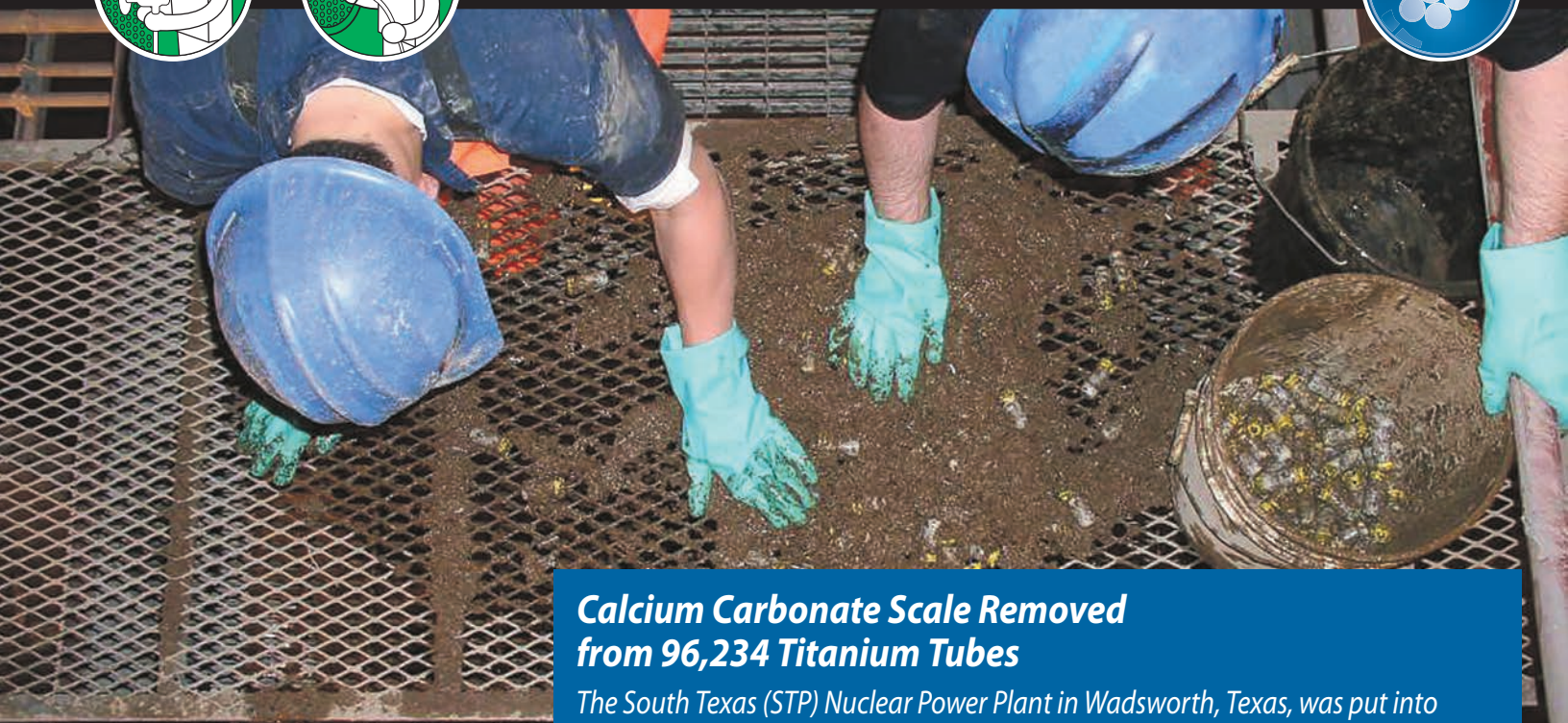
All Conco supervisors are full-time Conco employees, thoroughly trained in a full range of tube cleaning operations and applications. They come with a complete personal resume, including a list of plants where each supervisor has worked. Conco supervisors are prepared to work directly with non-union forces, casual work forces or union crews in expediting the completion of your project.



**Conco Supervisor and Crews Ready for Action**







## Calcium Carbonate Scale Removed from 96,234 Titanium Tubes

The South Texas (STP) Nuclear Power Plant in Wadsworth, Texas, was put into operation in 1988. It was designed with two condenser units, acting as heat exchangers to condense the power-generating steam back into a liquid state. It is imperative that the 96,234 titanium condenser tubes in each of the two units be maintained in as clean a state as possible to effect optimal condensing efficiency.

During a prior maintenance of the two condenser units that each produce 1,250 MW of power, a scale deposit was found in the tubes of Unit 1, which proved to be a tenacious form of calcium carbonate, or calcite. The deposit is a crystalline compound found in such materials as limestone and marble. The thickness of twenty samples tested at STP ranged from 7.6 mils to 31.2 mils, with an average of 19.06 mils. It was also discovered that over 20% of the tubes were blocked completely.

The Conco team arrived with a supply of mechanical tube cleaners called "Cal-Busters™," which are specifically designed to break the stratified calcium carbonate deposits. One pass was performed with undersized Conco C4S metal-bladed cleaners, followed by multiple passes of various sized Conco Cal-Buster calcium carbonate cutting cleaners that are stepped in size for inside diameters ranging from 0.620" to 0.694" and a final pass with a C4S to remove the fractured scale.

In all, 7½ cubic yards of calcium carbonate, weighing over 5,000 pounds, were removed from the 96,234 condenser tubes in Unit 1 and another 4 cubic yards, weighing over 3,000 pounds, were removed from Unit 2. As a result of the condenser tube cleaning and removal of the calcium carbonate scale, South Texas Project Nuclear Power Station reports an increase of upwards of 3 MW in power production from the two units, a significant improvement.







# TUBE SHOOTING, BRUSHING AND DRILLING

Improve your condenser and heat exchanger performance with the cleaning power of Conco.

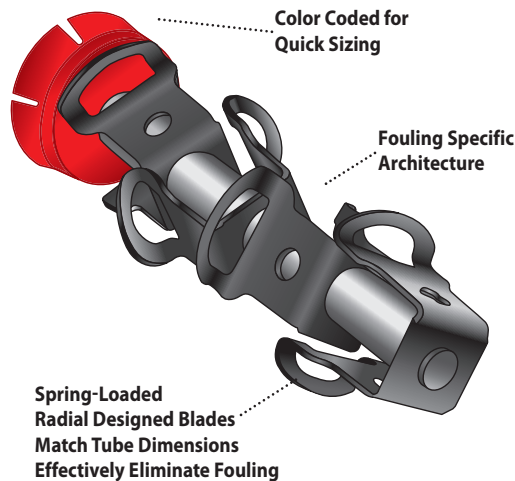
No one understands tube fouling better than Conco. We've engineered our tube cleaning systems to clean a wide range of deposits, including waterborne manganese, iron, corrosion product, sediment, crystalline and biofouling. Our systems have been used worldwide to clean over 150 million condenser and heat exchanger tubes quickly, safely and effectively. Conco systems include the ProSeries™ 200B Tube Cleaning System with TruFit™ Tube Cleaners, the ProSeries Excaliber™ Flex Shaft Tube Cleaning System, and the Dominator and Mitee Mouse II HydroDrills™ for high torque rotary drilling action.



## ProSeries 200B Tube Cleaning System with TruFit Tube Cleaners

When it comes to fast, efficient condenser and heat exchanger tube cleaning, the ProSeries 200B Tube Cleaning System has no equal. This two-gun pump system uses safe 300 PSI water pressure to propel TruFit tube cleaners through fouled tubes, removing deposits, corrosion product and obstructions in a single shot!

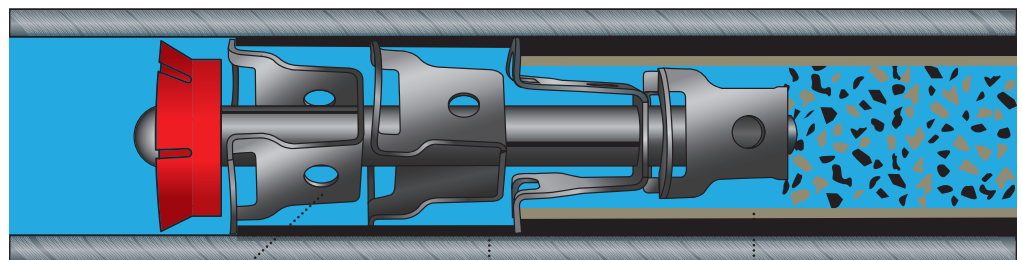
At the heart of this system are the Conco TruFit tube cleaners. Manufactured exclusively by Conco, each tube cleaner is designed for specific fouling types and sized for your exact tube dimensions to ensure safe, effective tube cleaning. Unlike other companies that shoot only one or two types of cleaners, Conco has more than a dozen designs engineered for effective removal of fouling and underlying corrosion. By removing underlying corrosion, you extend tube life and dramatically reduce the chance of tube failure. Made from quality materials and quality checked every step of the way, Conco TruFit tube cleaners are built to perform better than any other tube cleaner on the market.



*A Conco tube cleaner with TruFit technology is your guarantee that the tube cleaner you buy is a perfect match for your tube dimensions. Using a tube cleaner that claims to fit multiple tube dimensions, or one manufactured of low-quality material, can cause damage to tubing. Conco tube cleaners with TruFit are built by us in our factory using the best materials and are quality checked every step of the way. Insist on genuine Conco tube cleaners with TruFit technology!*



Conco Crew Shooting Tubes with TruFit Tube Cleaners



Spring-Loaded Radial Designed Blades

Scale and Corrosion

Soft Deposits







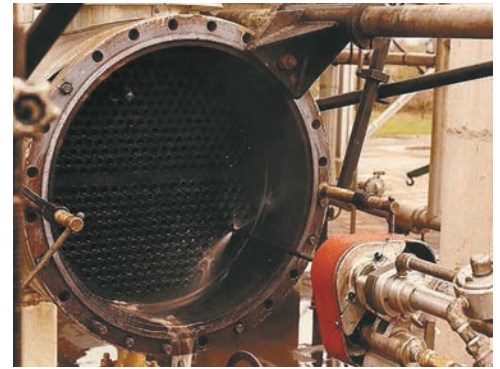
## The ProSeries Excaliber Flex Shaft Tube Cleaning System

Equipped with a 5.25 HP motor, the ProSeries Excaliber Flex Shaft Tube Cleaning System gives Conco crews the torque needed to scour away any deposit. This compact, portable system features a brush mounted to the tip of a flexible shaft, rotating at up to 2,500 RPM, and water flush to remove debris. As the flexible shaft rotates, water is pumped through the shaft casing to the cleaning tool, flushing away deposits as they are loosened. No electricity is required. The Excaliber uses plant air and water and is activated with a simple foot pedal. It is ideal for cleaning heat exchanger tubes from  $\frac{3}{8}$ " to  $1\frac{1}{2}$ " O.D. with heavy wall deposits or where limited access prevents conventional tube shooting.



## HydroDrill Tube Cleaning Systems

Utilizing a water flush and rotary drilling action, Conco HydroDrill Tube Cleaning Systems are the fastest and most effective way to remove difficult deposits from the inside of heat exchanger tubes, chemical reactors, condensers, re-boilers and absorbers. Sized properly, the heavy duty Dominator and hand held Mittee Mouse II units are designed for maximum cleaning effectiveness. Both units will quickly scour away hard deposits such as coke, calcium, sulfur, bauxite, asphalt, oxides and baked-on hard polymers. Depending on the system used, Conco crews can remove obstructions from any type of tube ranging from  $\frac{1}{2}$ " to  $2\frac{3}{4}$ " O.D. and up to 60' in length. Completely blocked tubes can be restored to 100% of the original tube I.D. in one pass. HydroDrill tube cleaning is fast, typically clearing 20-foot long tubes in only 30 to 90 seconds each. The system can even accommodate tubes that are bowed, since the long, slender Kelly Rod or Extension Rod that drives the bit inherently bends to follow the tube. Both HydroDrills are easy to set up and operate. A Conco crew can be in-the-cut in less than one hour. In the last 30 years, the HydroDrill system has successfully cleaned thousands of heat exchanger tubes, worldwide.







# FinTech<sup>™</sup> ACC AIR-COOLED CONDENSER CLEANING

**Conco FinTech ACC Services... the faster, safer way to clean any fin-fan, air-cooled condenser or heat exchanger.**

Fouled surfaces of air-cooled condensers and heat exchangers can cause performance issues, especially when ambient temperatures start to rise. Until now, cleaning fin-fan units meant tedious work at dangerous heights using fire hoses, hand lances or chemicals. While using fire hoses and hand lances can damage delicate fins, chemicals present environmental cleanup concerns.

FinTech ACC cleaning provides plants with a safer, more effective and affordable alternative to dangerous high-pressure or chemical cleaning. FinTech can accommodate any fin-fan, air-cooled condenser or heat exchanger and has been used successfully to clean fins fouled with dust, dirt, debris, pollen, leaves, insects and even bird and bat carcasses.

Conco can setup and operate a portable FinTech system to help you save on capital expenditures or operate your installed system. Whatever you prefer.

FinTech services have been used in power plants, chemical and petrochemical facilities and processing industry factories worldwide. FinTech is safe to use on all materials including steel, aluminum, brass and copper.

## How It Works

At the heart of the FinTech system is a computer-controlled 12-nozzle water jet assembly. The assembly travels on tracks at a constant speed and fixed height, ensuring a consistent clean from start to finish. Water nozzles on the assembly are configured to match fin geometry, ensuring that they clean all the way through, not just on the fin surface. The frame and tracks of the system are adjustable for virtually all sizes and layouts of fin-fan exchangers, including flat coolers, vertical coolers, "A" frame and "V" frame configurations. The system is suitable for use on all materials, including steel, aluminum, brass and copper.

## Features

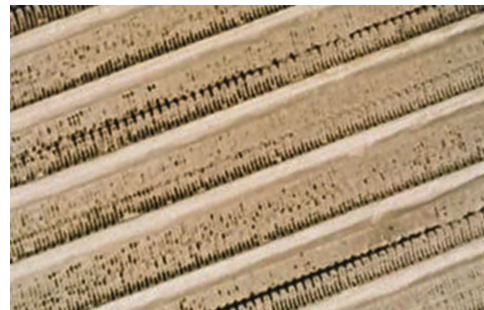
- Fast – driven at optimum speed, the nozzles can clean 325 square feet per hour
- More effective than cleaning with hand lances, foam washers or fire hoses
- No wait time for heat exchanger cooling, FinTech can be used while your system is online
- Safe – no personnel on scaffolds or exposed to hot, humid conditions during operations

“ FinTech has completely changed the operating dynamics of this facility. Our unit started showing measurable performance improvements during the one-quarter cleaned. ”

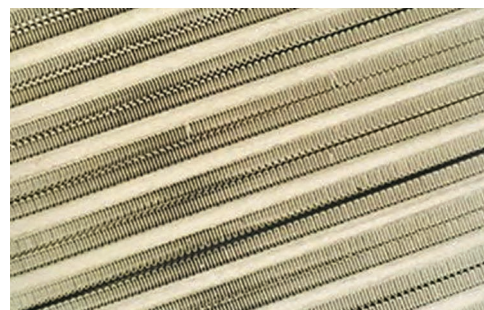
**Dan Gray**  
Director of Operations  
Rosebud Operating Services



Back of Fins During Cleaning Operations



Fins Before Cleaning with FinTech



Fins After Cleaning with FinTech









# NitroLance™ LIQUID NITROGEN CLEANING

The Conco NitroLance saves time and money in precision cleaning applications yielding zero secondary waste.

Harnessing the power of liquid nitrogen, NitroLance can remove incredibly difficult deposits safely and without producing secondary waste streams. It has been used in power plants to restore flow where severe airside fouling of heat exchange surfaces in air preheaters reduces power output. NitroLance is quicker than high-pressure water or chemical cleaning. And because liquid nitrogen readily dissipates, there is zero secondary waste saving our customers thousands of dollars in cleanup costs.

NitroLance is a safe alternative to high-pressure water jetting. Where high-pressure water can be hazardous at distances greater than six feet, the liquid nitrogen jet from NitroLance extends only a few inches.

Liquid nitrogen is ideally suited for adverse cleaning environments, yielding quicker turnarounds for

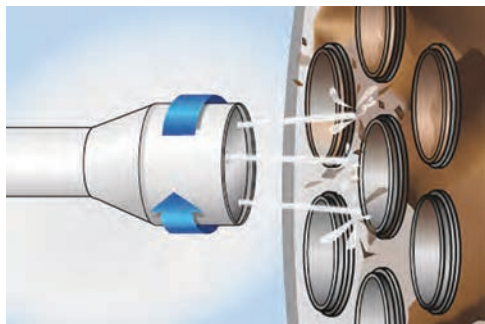
critical path components. In addition to being fast, NitroLance customers have reported performance improvements in heat transfer by up to 20% on units cleaned with this technology. NitroLance also provides optimal cleanliness for vessels being examined with Remote Field or Eddy Current Testing.

NitroLance is available with a variety of nozzle configurations for fast and effective cleaning of tough deposits in industries such as:

- Power Generation – Preheaters, Heaters and Coolers
- Refineries – Sulfur Recovery Units, Fire Heaters and Furnaces
- Catalyst Services – Reactor Cleaning
- Alumina – Bauxite Heat Exchanger Cleaning

## How It Works

The super-cooled cryogenic jet emerges from the NitroLance nozzle entering solid deposit cracks and crevices and then expands, rapidly breaking up deposits from the inside. NitroLance nozzles are customizable for any application ensuring precision cleaning. The NitroLance can clean vertical or horizontal heat exchangers in place, eliminating the need for costly removal or crane services.

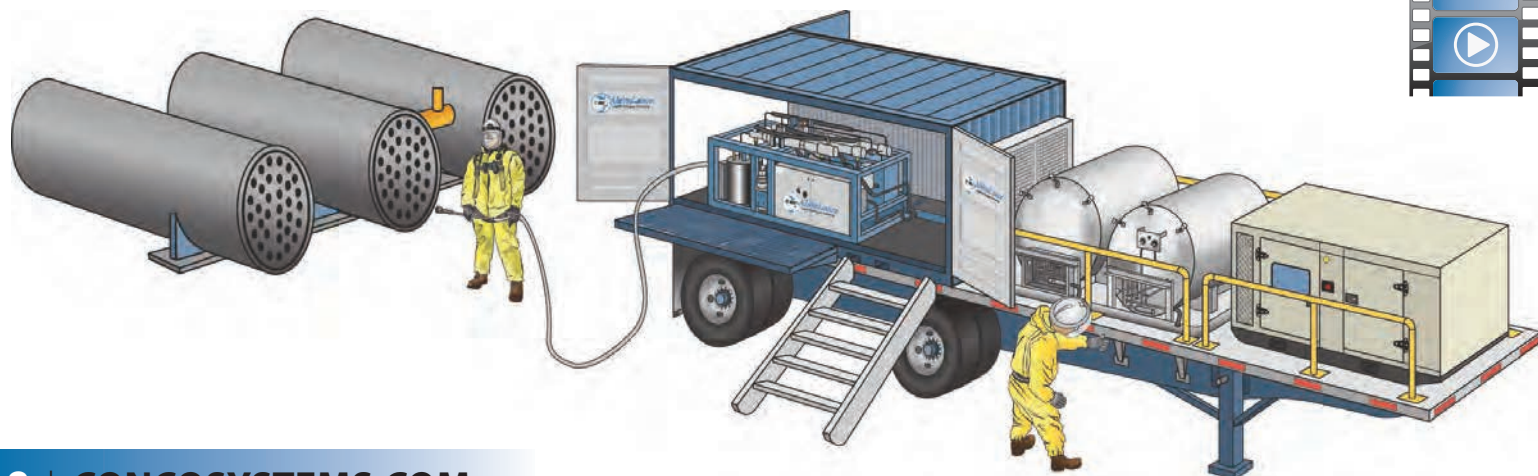


## Features

- Faster than hydrolance or chemical cleaning
- Dramatically improves turnaround time for critical path equipment
- Can remove deposits where conventional methods fail
- Liquid nitrogen evaporates leaving only the deposit to remove, saving you time and money
- Technology so safe on equipment, it has been used by NASA to clean the Space Shuttle



*Cleaning air heaters in power plants or recovery boilers has traditionally involved using high-pressure water, chemicals, or steam. These techniques, though effective on moderate airside fouling of heat exchange surfaces, are usually ineffective on the more tenacious deposits that can develop in coal-fired plants. If these deposits are not removed by periodic cleaning, heat transfer in the heaters is reduced, which in turn reduces boiler efficiency and increases a unit's heat rate. Severe fouling on air preheaters (APHs) can even reduce a unit's power output.*







0.320" Thick Hardened Carbon Based Deposit



NitroLance Clean



Preheater Fins Before Cleaning with NitroLance



Preheater Fins After Cleaning with NitroLance



Preheater Basket Before Cleaning with NitroLance



Preheater Basket After Cleaning with NitroLance





# NON-DESTRUCTIVE TESTING

**For Eddy Current, Remote Field and Near Field Testing...  
count on Conco for fast, reliable and accurate results.**

Conco Non-Destructive (NDE) Testing Services are performed for all utility, industrial and commercial customers on all types of tubing in condensers and heat exchangers included in the steam cycle, cooling water systems, service water systems and process systems. Non-Destructive Testing helps to prevent forced outages by detecting various defects such as pitting, cracking, corrosion, erosion, grooving, steam impingement and tube-support fretting that cause tube failures. Conco NDE personnel are certified in accordance with the American Society of Non-Destructive Testing (ASNT) SNT-TC-1A guidelines. In addition, Conco follows the most stringent nuclear guidelines. Our customers realize significant economic savings from routine testing through improved reliability and plant availability.



## Different Tubes Require Different Tests

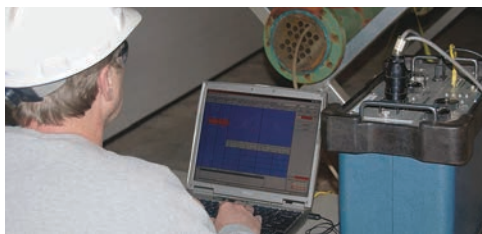
Condensers and heat exchangers come in a variety of sizes, shapes and materials. Tube materials can include carbon steel, stainless steel, admiralty brass and Cu-Ni alloys. No single nondestructive technique can test them all. It's crucial to select a testing company that has the capabilities and experience to provide a variety of testing techniques for your different tube materials. Also, understanding site-specific conditions and their effects on tube material such as wall thinning, chemical attack and pitting is fundamental in selecting the right test for the job.

## Eddy Current, Remote Field and Near Field Testing

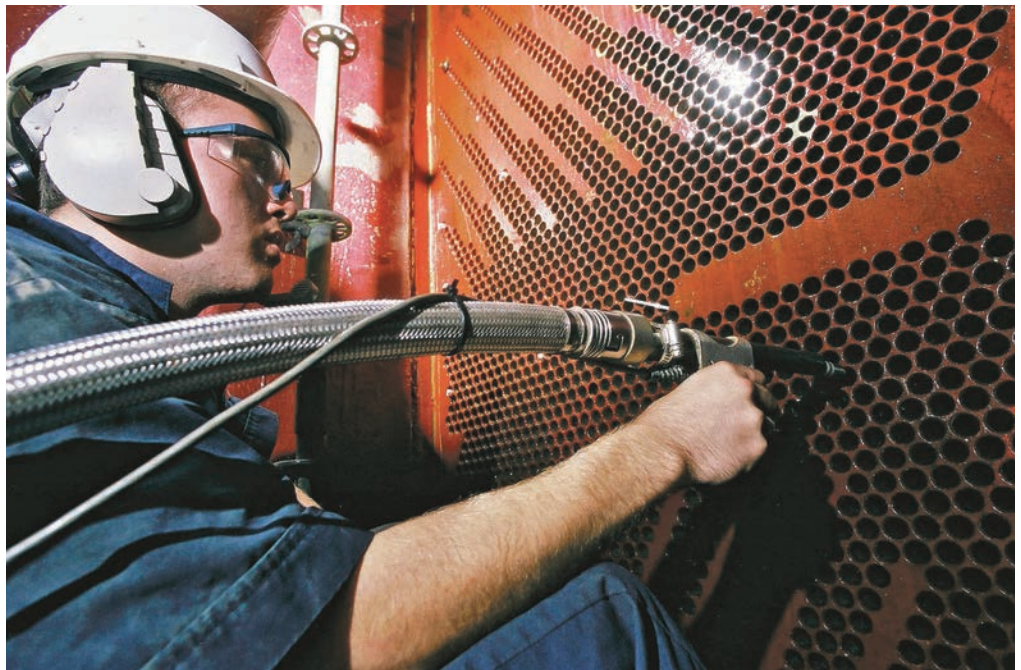
Conco Eddy Current, Remote Field and Near Field Testing Services specialize in finding tube defects in a variety of materials including stainless steel, titanium, brass and Cu-Ni alloys. Non-Destructive Testing can find defects ranging from pitting, cracking, corrosion, erosion, grooving and dents that cause tube failures. After testing, Conco provides each customer with a tube-by-tube analysis and full-color tubesheet map of the tested condenser or heat exchanger, giving a detailed assessment of the tubing.

***Did you know that more than 7,000 outages per year\* are attributed to tube failures costing the industry hundreds of millions of dollars in lost production and repair? Many power plants have created teams focused on preventing tube fouling and failure and Conco stands ready to assist you with yours. With numerous technical papers and contributions to organizations like EPRI and ASME, Conco is recognized as an expert on tube fouling and failure prevention. So, if you are serious about stopping tube failures, contact us today.***

\* Based on recent North American Electric Reliability Corporation Data.

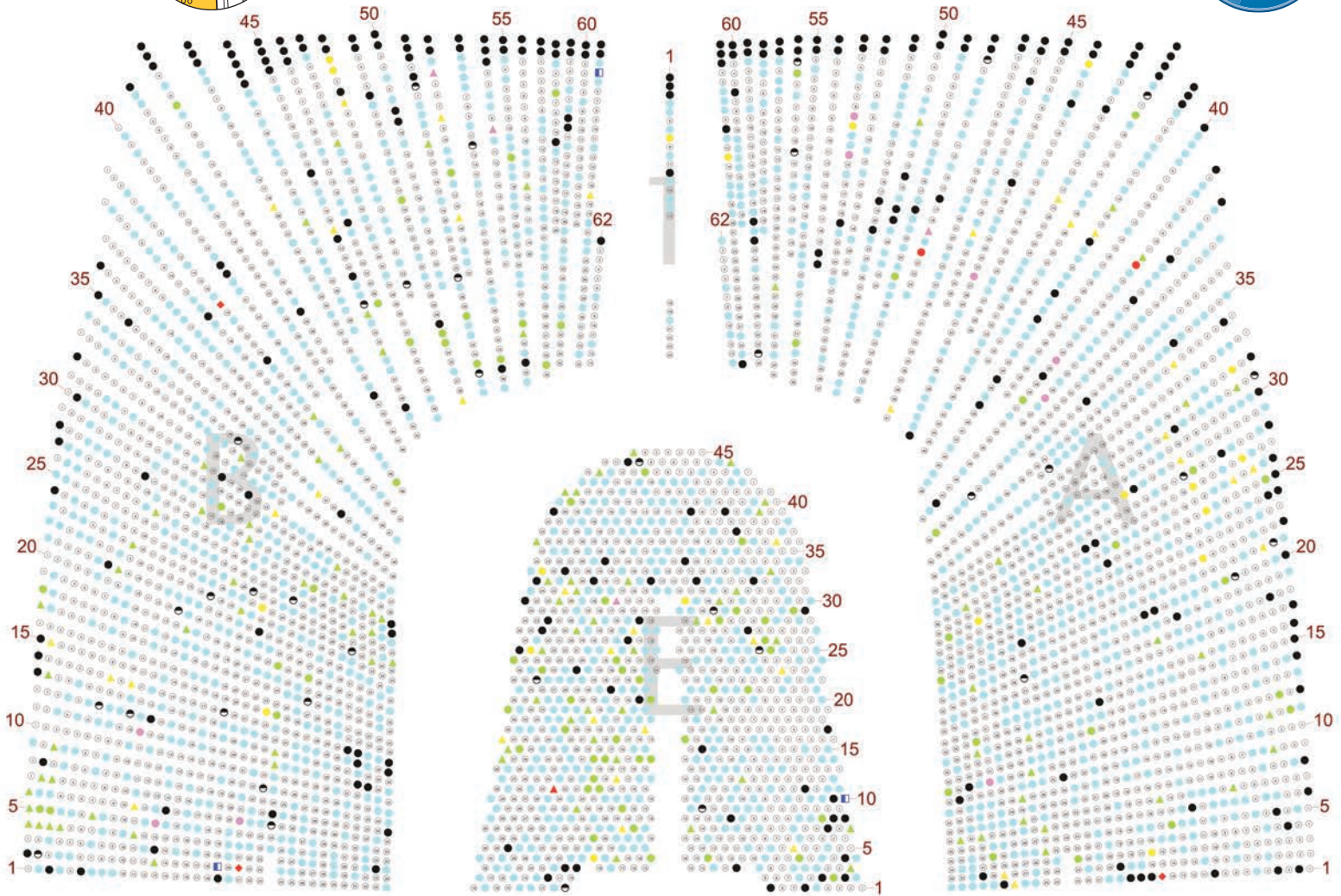


Conco Technician Acquiring Eddy Current Data



Conco Technician Performing an Eddy Current Test on a Main Steam Condenser





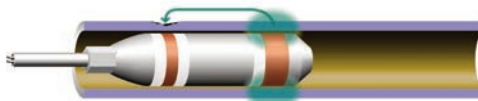
SYM	HITS	TUBES	VIS	TYPE	DESCRIPTION
■	0	0	0	QUERY	OBS_CALLS.qry
■	3	3	3	QUERY	RES_CALLS.qry
■	1409	1408	1406	QUERY	NDD_CALLS.qry
■	0	0	0	QUERY	PVN_CALLS.qry
●	45	45	37	QUERY	DNT_CALLS.qry
▲	112	109	108	QUERY	20-29.qry
▲	87	85	83	QUERY	30-39.qry
▲	39	39	39	QUERY	40-49.qry
▲	20	20	20	QUERY	50-59.qry
▲	9	9	9	QUERY	60-69.qry
▲	4	4	4	QUERY	70-79.qry
▲	1	1	1	QUERY	80-89.qry
▲	2	2	2	QUERY	90-100.qry
●	282	282	282	QUERY	PLG_CALLS.qry
■	3	3	3	QUERY	STC_CALLS.qry
	2,016	2,010	1,997		

## Tubesheet Mapping

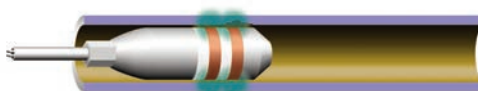
This service provides an at-a-glance summary of condenser or heat exchanger condition. Upon completion of a comprehensive non-destructive testing evaluation, Conco can create a multicolor tubesheet map for graphic illustration of tube wall condition. The overall condition of the condenser or heat exchanger and any developing trends are obvious as each tube's condition is represented by a different color or symbol.

## Data Analysis

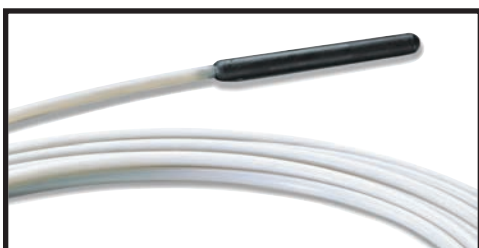
Depending on your requirements, our NDE analysts can provide on-site or remote data interpretation, utilizing the most advanced software for Eddy Current, Remote Field and Near Field Testing. Conco analysts will identify defects in your condenser or heat exchanger tubing and provide a comprehensive report of their findings. We can even assist you in the establishment of a non-destructive testing program. This allows Conco to trend the growth of previously identified damage within the condenser or heat exchanger. It also allows Conco to monitor for any new damage mechanisms that may occur during the operating cycle. This is part of a preventative maintenance program that Conco can help establish and maintain.



Remote Field Probe



Eddy Current Probe







# DEPOSIT AND TUBE FAILURE ANALYSIS

**Know your enemy and win the war  
on tube fouling and failure.**

Military strategist Sun Tzu once wrote "know your enemy and you will win a thousand wars." At Conco, we believe knowing what type of fouling deposits are within your tubes can help you win the war against tube fouling and failure.

By utilizing Conco's tube shooting method, crews are able to capture whole tube deposit samples. This would be virtually impossible to do with high-pressure water or chemical cleaning. These deposits are then analyzed and key elements and their organic content are identified. Armed with this information, your chemistry team can then make the necessary adjustments to your cooling water to reduce the impact of future deposits.



## Deposit Analysis

Once a Conco cleaning crew collects a deposit sample from a condenser or heat exchanger tube, the sample is sent to Conco's lab. There the sample is filtered and dried, and a loss-on-ignition test is performed. A representative portion is then analyzed, and a full report is provided to the customer.

## Deposit Density

Full-length tube deposit samples are taken by shooting Conco TruFit™ tube cleaners through selected tubes and collecting the deposits. These samples are then filtered, dried and measured to determine the deposit's weight in grams. Deposit density then provides information for trending and cleaning effectiveness.

## Tube Failure Analysis

Before you can prevent future tube failure, you must first determine the cause of current tube damage and failure. Conco's Tube Failure Analysis Service analyzes tube surface abnormalities. A tube is pulled from the subject condenser or heat exchanger. Then it is sectioned and subjected to a host of metallurgical examinations and tests. Once testing has been completed and all tube surface abnormalities identified, a full report is provided to the customer.

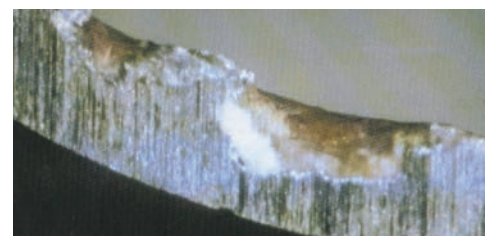
Deposit Analysis			
Plant:	Power Station		
Unit:	Unit No. 4 Condenser		
Tube Info:	1" O.D. x 22 BWG x 30' L		
Date of Sample:	January 8, 2014		
Analysis:	XRF (X-Ray Fluorescence)		
Elements (%):			
Iron	14.61	Manganese	17.30
Calcium	18.17	Nickel	0.002
Magnesium	2.36	Cobalt	0.002
Titanium	0.076	Tin	0.00
Potassium	0.16	Sodium	0.06
Silicon	22.95	Zinc	0.004
Aluminum	0.89	Copper	0.002
Zirconium	0.009	Molybdenum	0.002
Phosphorus	0.16	Sulfur	0.23
Loss on Ignition (750° C):			43.17
Samples:			
Cleaner Type	Passes	Deposit Wt. (g)	Deposit Wt. Density (g/sq.ft.)
C3S	1	18.46	2.77
C3S	1	12.93	1.94
C3S	1	21.05	3.15



Condenser Tube Fouled with Calcium Carbonate Scale



Tube Wall Showing Pitting Due to Magnesium Deposit



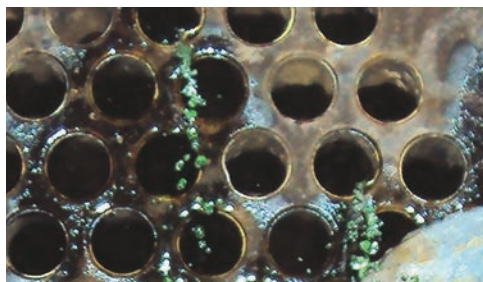
Damaged Tube End



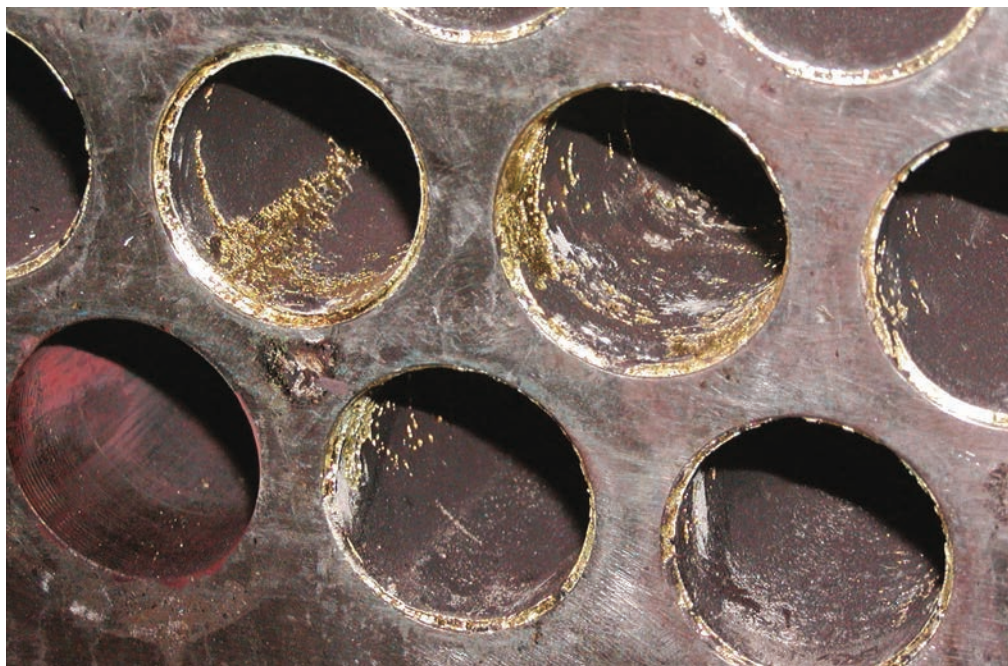


## Tube Cleaning and Tube Condition Assessment

Tube cleaning and tube condition assessments are available to help you determine the best and most suitable Conco tube cleaner for your site specific conditions. First, sample tubes are selected and cleaned using a variety of Conco tube cleaners. The tubes are then inspected for deposit removal. The cleaning efficiency of the selected Conco tube cleaning products are determined, reported to the customer and cleaning recommendations are made.



Leaking Tubes



Heat Exchanger with Eroded Tubes





# LEAK DETECTION SERVICES

**Increase plant performance and help put a stop to forced outages...  
locate and repair air inleakage and tube leaks today.**

Air inleakage negatively impacts plant performance, while tube leaks can cause forced outages costing plants thousands in maintenance and lost productivity. Using advanced tracer gas leak detection technology, Conco technicians can quickly locate sources of leaks within your plant. Conco has been an innovator and leading provider of leak detection services for over 30 years and offers both helium and SF<sub>6</sub> tracer gas technology.

Conco crews can detect:

- Condenser air in-leakage
- Condenser tube leakage
- Sources of dissolved oxygen
- Stator water system leakage
- Main generator leakage

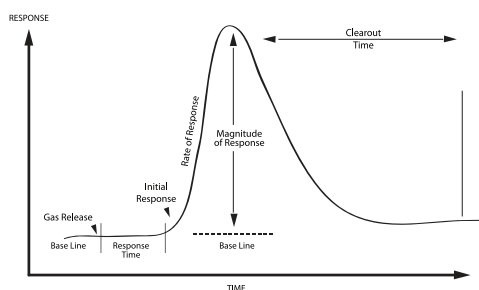
Depending on leak characteristics, a determination is made whether to mobilize with the helium mass spectrometer system, the state-of-the-art Conco Fluorotracer™ system, or both.



## Locating Sources of Air In-leakage

Conco pioneered the use of tracer gas technology to locate air in-leakage in power plants. Since 1978, Conco has restored performance to thousands of plants worldwide using exclusive technology. Our technicians are the best in the business with an average of 23+ years experience in the field. They're knowledgeable of all the components within your vacuum boundary. A typical 500 MW unit can be fully tested in one shift with no need for plant interruption. Our technicians are fully compliant with fossil and nuclear testing procedures and are confined space, first aid and CPR trained.

Chart Recording of a Typical Leak Response



*During a recent four-year period, condensers were responsible for more than 25,000 forced and scheduled outages, with condenser tube leaks being the primary source of generation loss.*

***Air in-leakage can negatively impact your unit's efficiency and also increase dissolved oxygen levels in your hotwell, which can lead to corrosion.***

## Locating Circulating Water Tube Leaks

Circulating water leaks can result from penetrations through the tube walls, from joints between the tubes and tubesheet, or from other penetrations between the water box and condenser shell. Contaminants in the circulating water change condensate chemistry, which can cause boiler or steam generator corrosion. Poor water chemistry can also cause stress corrosion cracking of turbine components. Our leak detection specializes in finding tube leaks within main condensers. Our methodical approach, using either helium or SF<sub>6</sub> tracer gases, ensures that we find even the smallest leaks.



Conco Technician with SF<sub>6</sub> Pack Unit Checking for Sources of Air In-leakage





## Helium Testing Services

Trained in all aspects of tracer gas leak detection, Conco technicians can use a Helium Mass Spectrometer System to inspect for condenser air in-leakage and/or condenser tube leakage while the unit is running. When the unit is down, they can test main generators and stator water systems for leakage. Unsurpassed in experience, Conco technicians have mastered the "art" of leak detection. In addition to field services, complete Helium Mass Spectrometer Systems and in-house training are available, see pages 28 to 29.

## SF<sub>6</sub> Testing Services

SF<sub>6</sub> has a detectable concentration of one part per ten billion versus helium's one part per million above background level. The ultra sensitive nature of this tracer gas makes it ideal for finding very small leaks within condenser tubes. Conco pioneered the use of SF<sub>6</sub> for power generation leak detection in 1978 and is the only company to manufacture a continuous sampling SF<sub>6</sub> analyzer! Our Fluorotracer analyzer takes full advantage of the detectable concentration of SF<sub>6</sub> and can also be used with our handheld SF<sub>6</sub>-Pak to perform air in-leakage surveys, making it an extremely versatile system. For complete SF<sub>6</sub> Systems and in-house training see pages 28 to 29.







# Plugging Services

**When you need to seal off a leaking or damaged tube, Conco is your one-stop source.**



If your condenser or heat exchanger tubes need to be plugged, call Conco. Different situations call for different types of plugs, and Conco has a full array of plugs in a variety of styles and materials to select from. Need a plug that can handle over 1,000 PSI? We've got you covered. Pulled a tube and now the tubesheet needs plugging? We've got a plug for that too. High temperatures an issue, not for Conco plugs.

Conco has a plug for every application. Our technicians are experts in diagnosing your needs and installing the best plug to solve your problem. Whether your need a temporary or permanent plug, count on Conco to get the job done right.



## A Plug for Every Type of Tube

When you need to plug off leaking tubes in condensers and heat exchangers, look no further than Conco. Our crews can accommodate any tube plugging application. Conco offers a full range of plug sizes, styles and materials to match your needs.


Our inventory includes High Confidence Plugs, tested to over 1,000 PSI under a wide range of temperature and vibration conditions. Our line of expanding tube plugs can be used for temporary or permanent plugging. While our EX-3 features an oversized washer to prevent it from being pulled into the tube by the vacuum of the unit, our EX-4 is designed to be placed inside the tube at exact locations. Our EX-F plug offers two separate gripping and sealing designs in one plug and seals to 400 PSI.

Need a temporary or emergency plug, then check out Conco Fiber Tube Plugs. These plugs install easily, expand when wet and will not damage tube sheets. They can be used in temperatures up to 230° F.

Type-1 Pin, and Type-2 Pin and Collar Tube Plugs come standard in titanium, stainless steel, brass and bronze. They seal at high temperatures, allowing continued use of the unit without major overhaul. They are ideal for use in the tubesheet where tube samples have been extracted.







# CONCO EQUIPMENT

## TUBE CLEANING SYSTEMS • LEAK DETECTORS • ACCESSORIES

### Now You Can Own And Operate The Same Equipment The Pros Use!

If you are an owner or operator of a plant facility and you want to perform your own cleaning projects, please contact Conco for your complete equipment needs and certified training. Our qualified supervisors will train you every step of the way, assuring quality, productivity and satisfaction. Conco manufactures a wide variety of state-of-the-art tube cleaning and leak detection equipment including our ProSeries™ 200B Tube Cleaning System with TruFit™ Tube Cleaners, Excaliber™ Flex Shaft and HydroDrill™ Rotary Tube Cleaning Systems with water flush, and ProSeries Helium Mass Spectrometer and SF<sub>6</sub> Fluorotracer™ Leak Detection Systems. No matter how difficult your deposit problem... whether it be microbiological, manganese and iron, calcium carbonate scale or anything in between... Conco has the solution. Call Conco today, and let our experts help you select the equipment, accessories and training you need to help you keep your condensers and heat exchangers running at peak efficiency.





# PROSERIES™ 200B TUBE CLEANING SYSTEM

Dependable, fast and built to last... the 200B will shoot tubes 1/2" to 1 1/2" O.D. with a 300 PSI water flush at 36 GPM.

The ProSeries™ 200B Tube Cleaning System features the same durable, field-proven machine that our crews use. This state-of-the-art equipment has effectively cleaned over 150 million condenser and heat exchanger tubes worldwide. Designed to shoot any make or model of tube cleaner through tubes from 1/2" to 1 1/2" O.D., it increases available water pressure to the 300 PSI necessary for effective cleaning. The unit is equipped with a 10 HP motor and durable positive displacement two-gun pump.

- Flexible – Can be used with any make or model of tube cleaner
- Portable – Complete with mobile base, can be easily moved to and around the job site

- Powerful – Features a robust 10 HP electric motor and heavy-duty pump generating 300 PSI of water pressure
- Reliable – Built from heavy-duty, industrial strength components, the 200B is designed for years of dependable performance

## How It Works

The ProSeries 200B pumps water at 300 PSI, propelling tube cleaners through condenser and heat exchanger tubes to remove deposits, corrosion product and obstructions in a single pass. For best results, use in conjunction with TruFit™ tube cleaners, see pages 20 to 23.

## Features

- 300 PSI two-gun pump
- Ergonomically designed easy action guns
- Industrial grade, safety yellow inlet and outlet hoses
- Large pneumatic tires
- Heavy-duty cart

## Specifications

**Motor Power:** 10 HP

**Input Power:** Standard

440 Volts, 60 Hz AC, three phase;

Optional 220 Volts or 380 Volts, 50 Hz

*Note: Additional wiring configurations available.*

*Please indicate your electrical requirements when placing your order or ask for our assistance in helping to determine your need.*

**Power Supply Cord:** 6', 10-4 Type SO

**Water Requirements:** Minimum 40 PSI at 36 GPM, Maximum 70 PSI at 36 GPM

**Output Water Pressure:** 300 PSI at 36 GPM

**Hoses:** 1 1/4" or 1 1/2" x 50' inlet, 3/4" or 1" x 50' outlet

**Pump:** Positive displacement

**Dimensions:** 2.6' high x 2.2' wide x 6.2' deep

**Weight:** 480 lbs net dry

**ProSeries 200B Tube Cleaning System** 200B Pump including 10 HP motor, positive displacement pump, water pressure inlet and outlet gauges, plumbing for up to two guns, pneumatic tires and heavy-duty cart  
**Call for Customization Options and Prices**

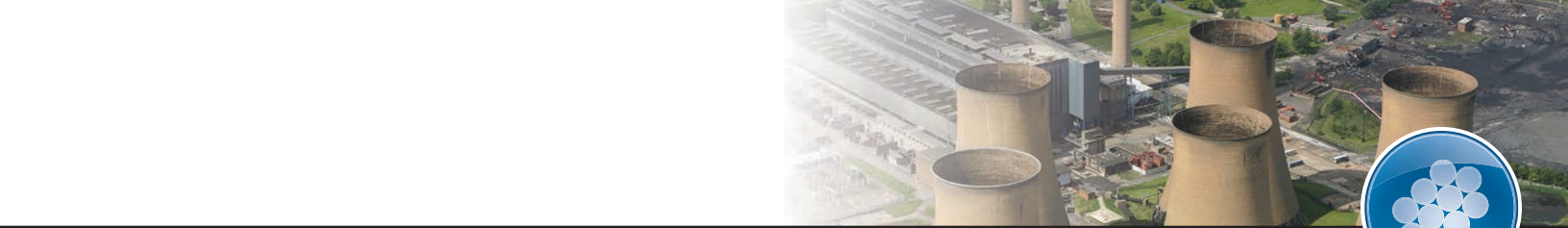
**Explosion Proof  
Model Available**



**ProSeries™**







## Water Guns

Available in bronze or lightweight aluminum with a spring-loaded fail-safe valve, the Conco Water Guns have proven ideal for heavy-duty use. Each gun features quick-change nozzles (available in brass, stainless steel and delrin) for tubes from 1/2" to 1 3/8" O.D. and powers all types and sizes of tube cleaners.

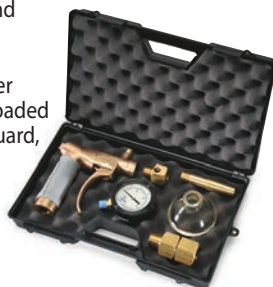
- Clear rubber splash guard prevents splash back
- SAFE – uses only non-compressible water pressure with a fail-safe, spring-loaded trigger valve
- Protective comfort grip rubber handle
- Few operating parts allows ease of use and repair

**WGCZ** Bronze Water Gun including spring-loaded fail-safe valve, splash guard, comfort grip handle, quick-change nozzle and carrying case

**Call for Price**

**WGCA** Aluminum Water Gun including spring-loaded fail-safe valve, splash guard, comfort grip handle, quick-change nozzle and carrying case

**Call for Price**



## Hoses

Conco's rugged, industrial strength hoses are rated to withstand pressures up to 800 PSI. They are bright yellow and wire braided with durable pressed-on NPT fittings on each end for safe, dependable service. Four standard sizes are available, all in 50' lengths. Inlet hoses are 1 1/4", 1 1/2" or 2" in diameter for use from the water source to the pump. Outlet hoses are 3/4" or 1" in diameter for use with the water guns. Quick disconnect fittings and special length hoses are available.

**HOS5450** Inlet Hose, 1 1/4" x 50' with NPT fittings

**Call for Price**

**HOS3250\*** Inlet Hose, 1 1/2" x 50' with NPT fittings

**Call for Price**

**HOS2150** Inlet Hose, 2" x 50' with NPT fittings

**Call for Price**

**HOS3450\*** Outlet Hose, 3/4" x 50' with NPT fittings

**Call for Price**

**HOS1150** Outlet Hose, 1" x 50' with NPT fittings

**Call for Price**



\* Note: Recommended sizes for new 200B ProSeries Pump Systems.

## Check Light

For visual inspection of tubes to locate obstructions, this light includes a 10', 16-3 cord with a three-prong plug for a 110 V supply, a 12 V transformer with handle and 50', 14-3 extension cord to lamp. It features a powerful one million candle power, 9" diameter, 12 V, DC lamp with pistol grip and adjusting knob to regulate light beam.

**MISCCLC** Check Light

**Call for Price**



## Tarps

Lightweight and easy to handle, our rugged tarps protect the tube cleaners as well as the surrounding area from damage when the cleaners exit the tubes. Mesh tarps are designed for use inside condensers and solid vinyl tarps are ideal for use outside heat exchangers.

**TAR6** Mesh Tarp, 6' x 6'

**Call for Price**

**TAR10** Mesh Tarp, 10' x 10'

**Call for Price**

**TAR12** Mesh Tarp, 12' x 12'

**Call for Price**

**TAR1216** Mesh Tarp, 12' x 16'

**Call for Price**

**TAR6V** Solid Vinyl Tarp, 6' x 6'

**Call for Price**

**TAR12V** Solid Vinyl Tarp, 12' x 12'

**Call for Price**



## Flexible Fiberglass Rod

Available in several diameters and in 10' increments, this rod is used for dislodging obstructions from tubes. Its flexible construction allows the operator to work in a confined area.

**FFR516** Flexible Fiberglass Rod, 5/16" diameter

**Call for Price**

**FFR716** Flexible Fiberglass Rod, 7/16" diameter

**Call for Price**

**FFR916** Flexible Fiberglass Rod, 9/16" diameter

**Call for Price**







# TRUFIT™ TUBE CLEANERS

Experience the ultimate in tube cleaning technology...  
experience the TruFit difference.

A Conco tube cleaner with TruFit technology is your guarantee that the tube cleaner you buy is the perfect match for your tube dimensions. Using a tube cleaner that claims to fit multiple tube dimensions, or one manufactured of low-quality material, can cause tube damage. Conco TruFit Tube Cleaners are built by us, in our factory, using the best materials and quality inspection techniques every step of the way. Insist on genuine Conco tube cleaners with TruFit technology.

At Conco, we know that all fouling is not created equal. Because tube deposits can be soft, hard or somewhere in between, we have developed over a dozen different styles and configurations of TruFit Tube Cleaners to tackle any type of deposit. Whether you have a

problem with mud, slime, algae, zebra mussels, manganese, iron, corrosion product, crystalline, calcium carbonate, or any other soft to hard deposit, Conco has your TruFit solution. Simply put, Conco TruFit Tube Cleaners are the best tube cleaners on the market!

## How They Work

Unlike other manufacturers who claim their "off the shelf" tube cleaners can clean a range of tube sizes, Conco TruFit Tube Cleaners are custom engineered to match your tube dimensions. By creating an exact match between the diameter of the tube cleaner and the tube I.D., we are able to maximize the cleaning effectiveness of the tube cleaner while preventing any damage to the tube wall.

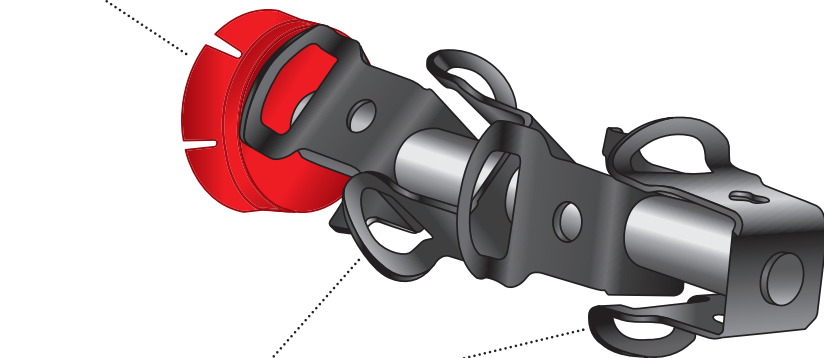
Got a difficult deposit? No problem. Our sales engineers work with you, helping you to select from over a dozen different types and styles of TruFit Tube Cleaners, assuring that the tube cleaner you select is a perfect fit for your application.

All Conco TruFit Tube Cleaners are:

- Custom built in our factory to match your exact tube dimensions
- Made from only the highest quality materials for maximum performance
- Individually inspected for quality assurance
- Designed with fouling specific architecture
- Color coded for quick sizing and easy identification

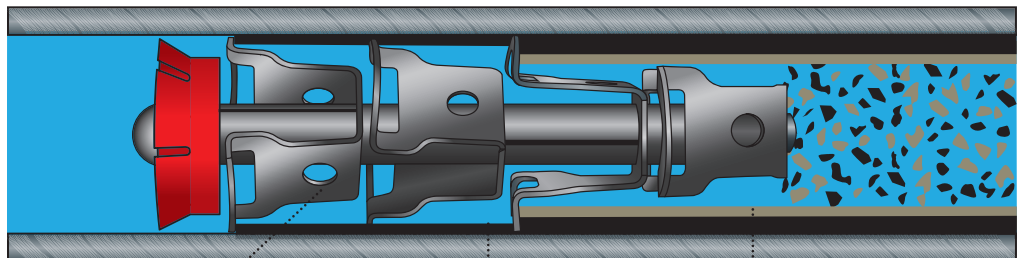


Color Coded for  
Quick Sizing



Fouling Specific  
Architecture

Spring-Loaded  
Radial Designed Blades  
Match Tube Dimensions  
Effectively Eliminate Fouling



Spring-Loaded  
Radial Designed Blades

Scale and Corrosion

Soft Deposits





## C4S Flexi-Blade Tube Cleaner

The C4S is an all-purpose tube cleaner for condensers and heat exchangers with tubes ranging from 1/2" to 1 1/2" O.D. This spring-loaded metal cleaner is highly effective on all types of deposits, including micro and macro fouling, organic type scales, corrosion and pitting by-products, and all types of obstructions. It can also be used safely with tube inserts and coatings on tubesheets.



### Features

- Four metal Flexi-Blade design provides overlapping tube I.D. coverage
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 12 times each

**C4S** Flexi-Blade Tube Cleaner

**Call for Quantity Discounts and Prices**



## C3S Rigid-Blade Tube Cleaner

The C3S is a heavy-duty tube cleaner for condenser and heat exchanger tubes ranging from 7/8" to 1" O.D. Effective on all types of deposits, its reinforced metal-bladed construction makes it especially effective for the removal of hard deposits, corrosion and pitting by-products and all types of obstructions.



### Features

- Three metal-bladed reinforced construction provides overlapping tube I.D. coverage
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 12 times each

**C3S** Rigid-Blade Tube Cleaner

**Call for Quantity Discounts and Prices**



## C4SS Stainless Steel Tube Cleaner

The C4SS Stainless Steel Tube Cleaner can be used on all types of tube materials in condensers and heat exchangers with tubes ranging from 3/4" to 1 1/4" O.D. Originally developed by Conco for application on AL-6XN and SeaCure stainless steel condenser tubing, it is also ideal for applications in highly corrosive environments.



### Features

- Four stainless steel-bladed design provides overlapping tube I.D. coverage
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 8 times each

**C4SS** Stainless Steel Tube Cleaner

**Call for Quantity Discounts and Prices**







# ADDITIONAL TRUFIT™ TUBE CLEANERS

For every condenser and heat exchanger tube deposit problem  
Conco has your TruFit solution.

## C2X and C3X Hex Tube Cleaners

The C2X and C3X Hex Tube Cleaners provide six points of cleaning contact per blade and are available to fit tubes ranging from 3/4" to 1 1/4" O.D. Hex Tube Cleaners are designed to remove thin tenacious deposits such as manganese, silica, iron and calcium. They are also effective in removing corrosion product and other types of debris and obstructions. Depending on the amount of fouling, choose between the two-stage C2X or the three-stage C3X models.

### Features

- Metal hexagon two or three-stage blade design
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 12 times each

**C2X and C3X** Hex Tube Cleaners  
Call for Quantity Discounts and Prices



## QTB Stainless Steel Brush

The QTB Stainless Steel Brush is designed for use on all types of tube materials in sizes ranging from 5/8" to 1 1/4" O.D. They can be used on tubes with inserts and epoxy coatings. The brush is particularly effective on manganese, iron and silica deposits. It is also effective on all types of obstructions, macrofouling and debris. The QTB will restore the tube surface to its original heat transfer characteristics, while providing absolutely the best protection from under-deposit corrosion.

### Features

- Stainless steel bristle design featuring over 1,000 contact points
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 12 times each

**QTB** Stainless Steel Brush  
Call for Quantity Discounts and Prices



## H-Brush

The H-Brush is typically utilized for removing light deposits in condensers and heat exchangers with tube ranging from 5/8" to 1 1/2" O.D. It removes micro and macro fouling, soft organic deposits, some corrosion by-products, mud and silt, and most types of obstructions. It can also be used in applications with enhanced tube surfaces and is safe on all inserts and epoxy coatings.

### Features

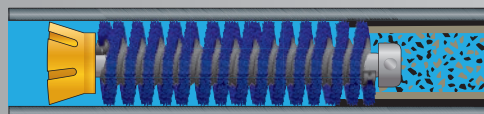
- Coil-bound nylon bristle design with nylon shaft
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 8 times each

**H-BRUSH** Coil-Bound Nylon Brush  
Call for Quantity Discounts and Prices



## XL-Brush and XXL-Brush

Larger than the H-Brush and exhibiting similar features, the 3 1/2" long XL-Brush and the 5 1/2" long XXL-Brush provide the advantage of extra length plus more nylon bristles for removal of most types of light deposits in condenser and heat exchanger tubes ranging from 5/8" to 1 1/2" O.D. for the XL-Brush and from 7/8" to 1 1/2" O.D. for the XXL-Brush.



### Features

- Coil-bound nylon bristle design with nylon shaft
- TruFit technology ensures a perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 8 times each

**XL-BRUSH and XXL-BRUSH** Coil-Bound Nylon Brushes  
Call for Quantity Discounts and Prices







## Plastic Tube Cleaner

The Type-P Plastic Tube Cleaner is designed for removal of only the softest types of deposits such as mud, silt and microbiological fouling in condensers and heat exchangers with tubes ranging from  $\frac{5}{8}$ " to  $1\frac{1}{4}$ " O.D. The Type-P fins are slit horizontally and vertically which, along with a small diameter hole in the core, allows water to bypass the cleaner to lubricate and flush out deposits.

### Features

- Multi-blade design
- TruFit technology ensures perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Can be shot up to 4 times each

**TYPE-P** Plastic Tube Cleaner  
**Call for Quantity Discounts and Prices**



## Cal-Buster™

Removing hardened calcium scale from the inside of condenser and heat exchanger tubes can be a difficult and time-consuming task. Traditional cleaning methods are virtually ineffective. The Cal-Buster was designed to fracture the eggshell-like surface of calcium carbonate. Once the calcium has been fractured, Conco C3S or C4S tube cleaner with TruFit™ technology are used to shoot out the calcium leaving a polished, like-new tube surface. Cal-Busters are available for use in tubes ranging from  $\frac{3}{4}$ " to  $1\frac{1}{4}$ " O.D., and require an on-site inspection to determine critical sizing information.

### Features

- Hard plastic body with two stages, each containing four cutting wheels
- Custom sized for tube I.D. and deposit thickness
- Safe, water-powered cleaner with speeds dependant on scale thickness
- Color-coded caps quickly identify sizing
- Environmentally friendly design allows for replacement of cutting wheels and reuse

**BUS** Cal-Buster  
**Call for Quantity Discounts and Prices**



## C2S U-Tube Cleaner

The C2S U-Tube Cleaner, featuring a robust, carbon steel construction, is designed to navigate u-tube configurations in heat exchangers and feedwater heaters, removing tough deposits that softer cleaners can't touch. The C2S U-Tube Cleaner features the same, spring-loaded design found in our larger cleaners ensuring effective cleaning and TruFit safety. The C2S U-Tube cleaner is available for tubes ranging from  $\frac{5}{8}$ " to  $1\frac{1}{4}$ " O.D.

### Features

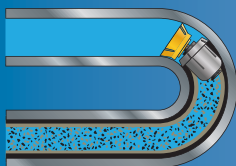
- Carbon steel design can remove tough deposits
- TruFit technology ensures perfect match to tube specifications
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 12 times each

**C2S** U-Tube Cleaner  
**Call for Quantity Discounts and Prices**



## Plastic U-Tube Cleaner

Thanks to its unique design, the Type-U Plastic U-Tube Cleaner can navigate very tight U-tube radiuses previously unreachable by conventional cleaners. By cleaning all the way through the bend, more accurate eddy current testing results can now be achieved. The Plastic U-Tube Cleaner is available for tubes ranging from  $\frac{1}{2}$ " to  $1\frac{1}{4}$ " O.D.



### Features

- Hard, plastic body, capable of navigating tight radiuses
- Safe, water-powered cleaner that travels at 10 to 20 feet per second
- Color-coded caps quickly identify sizing
- Can be shot up to 2 times each

**TYPE-U** Plastic U-Tube Cleaner  
**Call for Quantity Discounts and Prices**







**EXCALIBER™**  
*Pneumatic Flex Drive*

# TUBE CLEANING SYSTEM

This state-of-the-art rotary technology scours tubes clean even in tight and limited access locations.

Built ProSeries™ tough, the Excaliber Flex Drive Tube Cleaning System incorporates rotary tube cleaning action with a water flush to remove tough deposits in condenser and heat exchanger tubes from  $\frac{3}{8}$ " to  $1\frac{1}{2}$ " O.D. No electricity is required. This powerful unit uses only plant air and water to operate and is safe to use in any location. Shaft rotation and water flow is controlled by a simple foot pedal. The system is very easy to use and only minimum training is required.

At the heart of the Excaliber is a robust 5.25 HP air powered motor that drives a flexible shaft at speeds up to 2,500 RPM. Armed with the proper brush, the unit will scour off deposits and flush tubes clean in a single, efficient operation.

Excaliber can be configured to tackle almost any job. With a wide range of brushes for soft and hard deposits, the Excaliber is an extremely versatile tube cleaning system.

The Excaliber is ideal for cleaning:

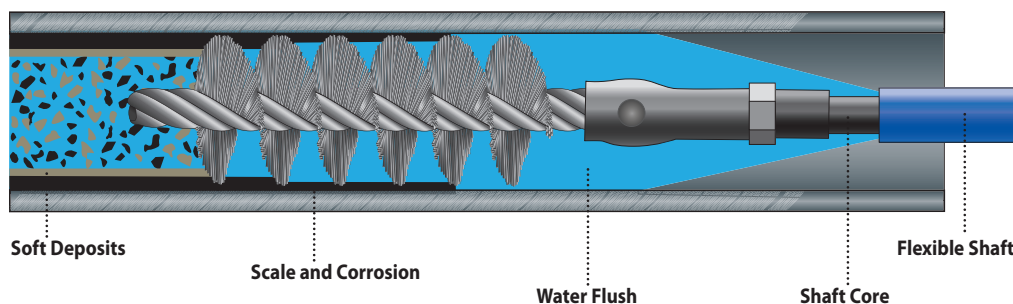
- Lube Oil Coolers
- Excitor Coolers
- Hydrogen Coolers
- Seal Oil Coolers
- Stator Coolers

## How It Works

The Excaliber Flex Shaft Tube Cleaner uses a brush mounted to the tip of a flexible shaft, rotating at up to 2,500 RPM, and a water flush to remove debris. As the flexible shaft rotates, the unit pumps water through the shaft casing to the cleaning tool, flushing away deposits as they are loosened.

## Features

- Air Powered, no electricity required
- Stainless steel and aluminum construction
- Adjustable speed and torque control
- Flexible shafts, up to 60' long
- Interchangeable brushes
- Air and water hose available in 25' and 50' lengths
- Foot pedal activation



**ProSeries™**

**Air Powered  
for Safety**

## Specifications

**Motor Power:** 5.25 HP

**Air Requirements:** Minimum 60 PSI at 85 CFM, Maximum 100 PSI at 175 CFM

**Water Requirements:** Minimum 30 PSI at 3 GPM, Recommended 50 PSI at 5 GPM, Maximum 125 PSI at 7 GPM

**Flexible Shaft Speed and Torque:** Adjustable, 300 RPM at 185 lb in to 2,500 RPM at 132 lb in

**Air and Water Hoses:**  $\frac{3}{4}$ " with Chicago quick connect fittings

**Dimensions:** 10" high x 26" wide x 8" deep  
**Weight:** 36 lbs net dry

**P2000XCAL** Excaliber Pneumatic Flex Drive Tube Cleaning System including foot pedal with quick connect air fitting

**Call for Customization Options and Prices**

*Note: See page 25 for air/water hoses, flexible shafts and brushes.*



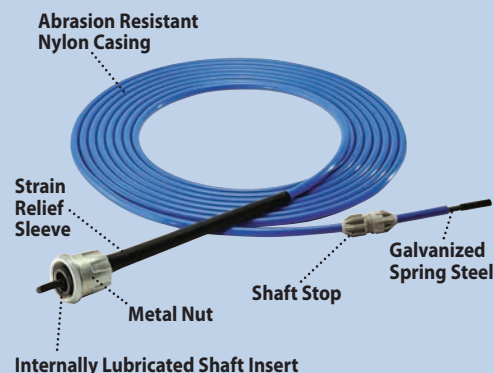


## Flexible Shafts

No matter what type of condenser or heat exchanger tubes you are cleaning, Conco has the flexible shaft to match your application. Our shafts feature an abrasion resistant nylon casing to withstand harsh industrial environments, an internally lubricated shaft insert to reduce friction and a galvanized spring steel core with multiple counter rotated windings for long life. All shafts are equipped with a metal nut to provide a secure connection to the Excaliber and a strain relief sleeve molded with variable thickness to provide a gradual radial bend to help prevent breakage. A shaft stop can be positioned anywhere along the shaft to let you know when the end of the tube has been reached. Custom shafts are available for dry and high temperature applications.

### SAFLXSHNY Flexible Shafts – Nylon Casing

Shaft O.D.	Tube I.D.	Length	Thread
1/4"	0.281" to 0.437"	15'	8-32 F
3/8"	0.437" to 0.625"	25'	1/4-28 F
3/8"	0.437" to 0.625"	45'	1/4-28 F
3/8"	0.437" to 0.625"	60'	1/4-28 F
1/2"	0.625" to 1.25"	25'	1/4-28 F
1/2"	0.625" to 1.25"	45'	1/4-28 F
1/2"	0.625" to 1.25"	60'	1/4-28 F
9/16"	0.687" to 1.25"	25'	1/4-28 F
9/16"	0.687" to 1.25"	45'	1/4-28 F
9/16"	0.687" to 1.25"	60'	1/4-28 F
3/4"	1.25" to 1.5"	25'	1/4-28 F
3/4"	1.25" to 1.5"	35'	1/4-28 F
3/4"	1.25" to 1.5"	60'	1/4-28 F



Note: Couplings available to connect brushes with mismatched threads.

Call for Quantity Discounts and Prices

## Brushes

Always match the brush material to the tube material and deposit. Use Nylon Brushes for soft deposits in any tube and Brass Brushes for deposits on copper or brass tube materials. Only use Stainless Steel Brushes for deposits on materials such as carbon steel, stainless steel and titanium. Use Spin-Grit Brushes to clean and polish the lands and grooves of enhanced tubes.



### SABRNY Nylon Brushes

Brush Size	Thread	Brush Size	Thread
5/16"	8-32 M	11/16"	1/4-28 M
3/8"	8-32 M	3/4"	1/4-28 M
7/16"	1/4-28 M	13/16"	1/4-28 M
1/2"	1/4-28 M	7/8"	1/4-28 M
9/16"	1/4-28 M	15/16"	1/4-28 M
5/8"	1/4-28 M	1"	1/4-28 M



### SABRBR Brass Brushes

Brush Size	Thread	Brush Size	Thread
5/16"	8-32 M	11/16"	1/4-28 M
3/8"	8-32 M	3/4"	1/4-28 M
7/16"	1/4-28 M	13/16"	1/4-28 M
1/2"	1/4-28 M	7/8"	1/4-28 M
9/16"	1/4-28 M	15/16"	1/4-28 M
5/8"	1/4-28 M	1"	1/4-28 M



### SABRSS Stainless Steel Brushes

Brush Size	Thread	Brush Size	Thread
5/16"	8-32 M	11/16"	1/4-28 M
3/8"	8-32 M	3/4"	1/4-28 M
7/16"	1/4-28 M	13/16"	1/4-28 M
1/2"	1/4-28 M	7/8"	1/4-28 M
9/16"	1/4-28 M	15/16"	1/4-28 M
5/8"	1/4-28 M	1"	1/4-28 M



### SABRSG Spin-Grit Brushes

Brush Size	Thread	Brush Size	Thread
1/2"	1/4-28 M	1"	1/4-28 M
3/4"	1/4-28 M	1 1/4"	1/4-28 M



Note: Brushes should be equal to or 1/16" smaller than tube I.D.  
Call for Quantity Discounts and Prices

## Air/Water Hoses

Made of abrasion resistant, industrial grade red rubber, Conco air/water hoses are designed for harsh environments. These heavy-duty hoses feature galvanized steel Chicago fittings for durability and quick, easy connection to Conco equipment. They have a 3/4" I.D. for ideal flow and are available in 25' and 50' lengths.

Conco air/water hoses are for use with the Excaliber Pneumatic Flex Drive System, and the HydroDrill™ Dominator and Mitee Mouse II units.



**P2000XCAL-HOSE-25** Air/Water Hose 3/4" x 25'  
with quick connect Chicago fittings **Call for Price**  
**P2000XCAL-HOSE-50** Air/Water Hose 3/4" x 50'  
with quick connect Chicago fittings **Call for Price**







# HydroDrill<sup>TM</sup> TUBE CLEANING SYSTEMS

**Got scale? No Problem. These rotary tube cleaners will even clear tubes plugged solid with hard deposits.**

Designed to solve the most difficult deposit problems, Conco HydroDrills combine powerful rotary tube cleaning action with a 2 to 3 GPM water flush to clear even completely blocked tubes. They are ideal for cleaning all types of heat exchangers including chillers, oil coolers, condensers and process manufacturing tubes.

Conco offers two versions of the HydroDrill, the Dominator and the Mitee Mouse II. The Dominator is our large heavy-duty unit. It is powered by compressed air and a booster pump delivering 250 PSI at a minimum of 20 GPM (32 GPM recommended) and is designed to clean tubes from 1/2" to 2 3/4" O.D. The Mitee Mouse II is a hand held unit, powered by compressed air and water, and is designed to clean tubes from 1/2" to 2 3/4" O.D.

Both the Dominator and the Mitee Mouse II are easy to set up and operate. HydroDrill tube cleaning is fast and efficient. A 20' long tube can be cleared of hard deposits in only 30 to 90 seconds. A heavily fouled or even a completely blocked tube can be easily restored to its original I.D. in a single pass. Cleaning with HydroDrill brushes can restore a tube's interior to as-new condition.

HydroDrills are used to remove hard tough deposits including:

- |           |            |
|-----------|------------|
| ■ Coke    | ■ Alumina  |
| ■ Calcium | ■ Asphalt  |
| ■ Sulfur  | ■ Oxides   |
| ■ Bauxite | ■ Polymers |

## How They Work

A HydroDrill uses a brush or drill bit mounted to the tip of a rotating Kelly Rod or Extension Rod and a water flush to remove debris. As the rod rotates, the unit pumps water through the rod to weep holes in the cleaning tool, flushing away hardened deposits as they are loosened.

## Safe On Tubes

The HydroDrill system is designed for maximum cleaning effectiveness with no tube damage. Drill bits are sized to be 0.005" below the minimum tube I.D. They feature long shanks to ensure that the axis of the bit and the axis of the tube are in complete alignment. Furthermore, the bits are designed with carbide tips on the leading edge only and rounded corners to ensure no sharp edges directly impact tube wall. The drill also rides on a thin layer of water for lubricating bearing surfaces between the bit and the tube. HydroDrills have been used repeatedly to clean process fouling on some heat exchangers over 1,000 times – with no tube damage or degradation!

## Features

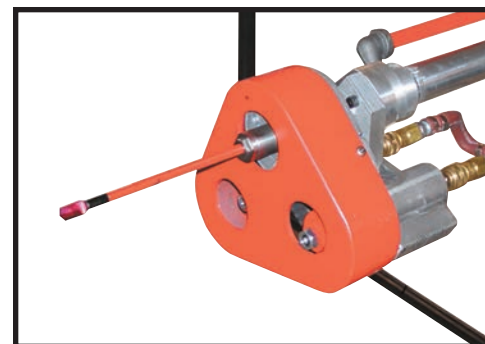
- Air and water powered (no electricity required)
- Heavy-duty construction
- Custom length Kelly Rods (Dominator) and sectional Extension Rod design (Mitee Mouse II) for extending shaft length
- Interchangeable brushes and drill bits
- Air and water hose available in 25' and 50' lengths
- Hand lever activation

## Dominator HydroDrill Tube Cleaning System

### Specifications

**Motor Power:** 1 HP  
**Air Requirements:** Minimum 80 PSI at 125 CFM  
**Water Requirements:** Minimum 250 PSI at 20 GPM  
**Water Flush at Drill Tip:** 2 to 3 GPM  
**Flexible Shaft Speed:** 1,200 RPM, Free Spinning 2,400 RPM  
**Air and Water Hose:** 3/4" with Chicago quick connect fittings  
**Packaged and Ready for Shipment –**  
**Crate Dimensions:** 24" high x 24" wide x drill length + 2' deep  
**Crate Weight:** 1,200 lbs net dry

**GLDR-DOM** Dominator HydroDrill Tube Cleaning System including barrel assembly complete with dual or single motor drive and one Kelly Rod, support mast complete with adjustable A-arms, filter lubricator assembly and foot pedal assembly  
**Call for Customization Options and Prices**



*Note: Front and rear stand required for horizontal operation.  
Note: A 5 HP "Terminator" option is available for the toughest deposits on tubes larger than 1 1/8" O.D. only. All components are the same with the exception of the 5 HP "Terminator" drive.  
Note: Pumping system not included, call for pump options.  
Note: See page 27 for Kelly Rods, brushes and drill bits.*

## Mitee Mouse II HydroDrill Tube Cleaning System

### Specifications

**Motor Power:** 0.8 HP  
**Air Requirements:** Minimum 90 PSI at 22 CFM  
**Water Requirements:** Minimum 25 PSI at 20 GPM  
**Water Flush at Drill Tip:** 2 to 3 GPM  
**Flexible Shaft Speed:** 5,000 RPM, Free Spinning 6,000 RPM  
**Air and Water Hose:** 3/4" with Chicago quick connect fittings  
**Dimensions:** 11" high x 7" wide x 14" deep  
**Weight:** 10 lbs net dry

**GLMM** Mitee Mouse II HydroDrill Tube Cleaning System including hand held drill unit with drive cone and rod, eight 3' Extension Rods, eight sub connectors, two sub adaptors, 3/4" x 7" air hose with oiler and tool box

**Call for Customization Options and Prices**



*Note: See page 27 for Extension Rods, brushes and drill bits.*





## Kelly Rods for the Dominator

Conco Kelly Rods are long square metal tubes available in various lengths custom ordered to suit the HydroDrill and heat exchanger tubing to be cleaned. They are available in 5/16" (1/4 – 28 female thread), 3/8" (5/16 – 24 female thread) and 1/2" (3/8 – 24 female thread).

**GLHD-ASSY-KR33** Kelly Rod for Dominator  
[Call for Price](#)

## Extension Rods for the Mitee Mouse II

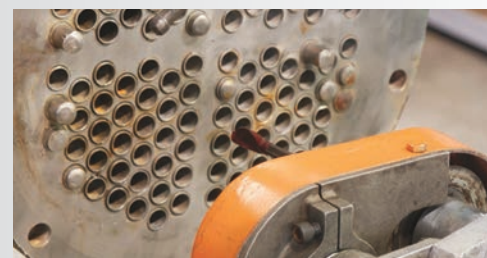
Conco Extension Rods are a round heavy wall metal tubes available in 3' or 6' lengths that are connected to extend the reach of the drill. They are coupled together using Kelly Connectors. Extension Rods are available in 5/16" (1/4 – 28 female thread), 7/16" (5/16 – 24 female thread) and 1/2" (3/8 – 24 female thread).

**GLMM-EXT** Extension Rod  
[Call for Price](#)

## Kelly Subs and Connectors

Made with both male and female threads Kelly Subs are used to adapt drill bits and brushes to both Kelly Rods and Extension Rods. To preserve the female threads on the rods it is recommended to use the hardened subs. Kelly Subs can also be used to adapt to various drill bit threads. Kelly Connectors are used to connect a short extension onto a Kelly Rod and also to connect the Extension Rods of the Mitee Mouse II

**GLKELLY-SUB** Kelly Sub  
**GLKELLY-CON** Kelly Connector  
[Call for Price](#) [Call for Price](#)



## Brushes

HydroDrill brushes feature weep holes to allow the water flush to pass from the Kelly Rod or Extension Rod into the tube to flush away deposits. They are used to polish tube surfaces smooth and help keep deposits from adhering during operation. The result is extended operation between cleanings and enhanced equipment reliability. Nylon Brushes are used for removal of biofouling or thin silt like deposits on all tube surfaces. Brass Brushes are ideal for removal of thin soft deposits or for high speed polishing of copper tube materials. Only use Stainless Steel Brush on hard tube materials for removing all types of soft tube deposits, stronger cleaning ability and durability.

**GLBRNYL** Nylon Brushes  
available in sizes ranging from  
3/4" x 12 to 2" x 12

**GLBRBRA** Brass Brushes  
available in sizes ranging from  
3/4" x 12 to 2" x 12

**GLBRQ** Stainless Steel Brushes  
available in sizes ranging from  
3/4" x 12 to 2" x 12



*Note: Custom sizes available.  
Note: Brushes should be equal to or 1/16" smaller than tube I.D.*

[Call for Quantity Discounts and Prices](#)

## Twist Bits

Got a completely blocked tube? Conco has your solution. Our line of Twist Bits power through blockages quickly. They feature a wide, flat blade with optimum flushing volume for deposit removal.

**GLBTTW** Twist Bits, available in sizes ranging from 5/8" x 12 to 1 1/2" x 21  
[Call for Quantity Discounts and Prices](#)



*Note: Additional Sizes available.  
Bit should be 0.005" smaller than tube I.D.*

## Red Witch Bits

Conco Red Witch Bits are ideal for removing thin and thick wall scale. They are the preferred bit for copper based tubes because of the excellent water barrier maintained between the bit and the tube.

**GLBTRW** Red Witch Bits, available in sizes ranging from 1/2" x 18 to 1 x 18  
[Call for Quantity Discounts and Prices](#)



*Note: Additional Sizes available.  
Bit should be 0.005" smaller than tube I.D.*

## Klaw Bits

Our line of Klaw Bits are only for use in tubes with O.D.s of 1 1/4" or larger. They offer excellent flushing action for large tubes that have thick wall scale or are completely blocked.

**GLBTKL** Klaw Bits, available in sizes ranging from 1 1/4" x 12 to 2 3/4" x 12  
[Call for Quantity Discounts and Prices](#)



*Note: Additional Sizes available.  
Bit should be 0.005" smaller than tube I.D.*





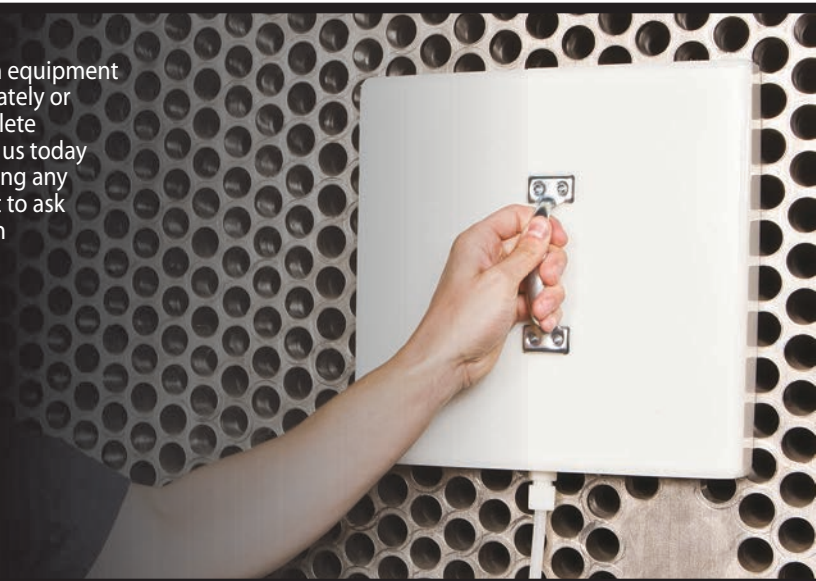
# PROSERIES™ LEAK DETECTORS

Step up your game... step up to ProSeries Leak Detectors and zero in on the source of your air inleakage and tube leak problems!

As a facility owner or operator now you can own the same dependable, Tracer Gas Leak Detection Systems that Conco pros use in the field. Conco first pioneered the use of tracer gas technology in 1978 to locate air inleakages in power plants, and we are still innovators today.

For the best in leak detection technology, choose either a helium mass spectrometer or our exclusive SF<sub>6</sub> Fluorotracer™ system. Armed with either unit, you'll be ready to perform leak detection surveys on your own schedule.

All Conco leak detection equipment can be purchased separately or in convenient kits complete with carrying cases. Call us today for special package pricing any system, and don't forget to ask about our leak detection training program.



## The Helium Mass Spectrometer

The Helium Mass Spectrometer is a rugged and dependable tool for finding and measuring leaks in the most demanding applications. With its low initial price and low cost of ownership, this unit is the most cost-effective leak detector available. It can detect a minimum detectable leak at 1,000 ppm, ambient helium being  $2 \times 10^{-9}$  atm-cc/sec helium. It is available in 115 V or 230 V, 50/60 Hz AC models.



**LDHEDET** ProSeries Helium Mass Spectrometer  
**Call for Price**

### HELIUM MASS SPECTROMETER KIT

Tracer Gas Leak Detection Kit including a helium mass spectrometer, off gas sampling unit, condenser tube inspection unit, strip chart recorder, communication system, and carrying cases

**Call for Price**

*Note: See page 29 for complete item descriptions.*

## The Fluorotracer Analyzer

The Conco Fluorotracer Analyzer is a compact, easy to operate instrument designed to detect sulfur hexafluoride with sensitivity as low as one part per billion (1.0 ppb). This unit is capable of performing both air in-leakage and condenser tube leak inspections in addition to finding sources of dissolved oxygen. You can even perform online injections of SF<sub>6</sub> with your unit at full power to determine which unit has a leaking bundle saving you time and money! It is available in 115 V or 230 V, 50/60 Hz AC models.



**LDFLDET** ProSeries Fluorotracer Analyzer  
**Call for Price**

### FLUOROTRACER ANALYZER KIT

Tracer Gas Leak Detection Kit including a Fluorotracer analyzer, SF<sub>6</sub>-Pak, modified hydrogen regulator, off-gas sampling unit, online injection unit, strip chart recorder, communication system and carrying cases

**Call for Price**

*Note: See page 29 for complete item descriptions.*







## SF<sub>6</sub>-Pak

The Model 202 SF<sub>6</sub>-Pak is an 8 lb, hand-held dispenser of sulfur hexafluoride gas in a refillable canister. Powered by a rechargeable battery, the SF<sub>6</sub>-Pak can adjust gas concentrations from 30 ppm to 500 ppm, and the gas supply lasts approximately sixty hours at a continuous flow of 100 ppm concentration.



**LDSF6P** SF<sub>6</sub>-Pak Hand-Held Sulfur Hexafluoride Dispenser

**Call for Price**

## Strip Chart Recorder

The recorder is required for accurate tracking and interpretation of leak detection data. Included are a single pen strip chart recorder, pens, chart paper and a carrying case for storage. It is available in 115 V, 50/60 Hz AC only.

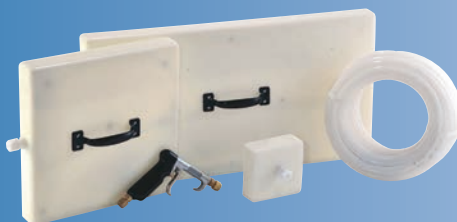


**LDCHARTREC** Strip Chart Recorder

**Call for Price**

## Condenser Tube Inspection Unit

This equipment is required for a successful condenser tube inspection utilizing the Conco Fluorotracer Analyzer or Helium Mass Spectrometer. Included are 3 plenums, 100' of polyethylene tubing, a tracer gas release gun and quick disconnect fittings. The isolation of a tube leak is accomplished by reducing the size of the plenums and then finally pinpointing the leaking tube with a "single tube shooter."



**LDTUINUNHE** Condenser Tube Inspection Unit

**Call for Price**

## On-Line Injection Unit

This unit contains all of the equipment required to perform SF<sub>6</sub> injections into the circulating water train to determine the leaking water box. It includes a 0 to 15 scfm rotameter, 50' of 1/2" flexible tubing, quick disconnects and an SF<sub>6</sub> regulator. On-line injections allow plant personnel to accurately select the water box to be drained for the "hands on" condenser tube inspection, thereby reducing downtime and maximizing plant efficiency.



**LDFONLINE** On-Line Injection Unit

**Call for Price**

## Communications Unit

A communications unit is required for the isolation of leaks during all leak detection inspections. Included are two wireless headsets. They feature level dependent, external microphones to allow the user to hear environmental sounds such as warning signals. They have an external audio input to allow connection to an external phone or portable two-way radio and a noise-cancelling speech microphone with voice-operated transmission for hands free operation.



**LDCOMMP** Communications Unit

**Call for Price**

## Off-Gas Sampling Unit

The off-gas sampling unit is compatible with helium and sulfur hexafluoride gas (SF<sub>6</sub>). The sample from the condenser off-gas is taken from the vacuum pump or air injector and pumped through the tubing, water trap and desiccant dryer using an air mover. The equipment is required for air in-leakage, condenser tube leak testing and on-line injections.



**LDOFFGAS** Off-Gas Sampling Unit

**Call for Price**

## Tube Markers

Once the location of a leaking tube has been identified, the tube must be marked for plugging or repair. Conco offers a line of plastic Tube Markers in a full range of sizes. While the nonabrasive plastic fins allow the marker to be easily inserted into and out of the tube, the over sized color coded base holds the marker against the tube sheet, preventing it from getting stuck inside the tube.



**TMP** Tube Markers

**Call for Quantity Discounts and Prices**

## Leak Detection Training

Conco will provide Leak Detection Training at your site. Training is performed on a time and material basis utilizing a senior staff member to train up to ten persons per our two-day training class. First day instruction includes startup, operation, maintenance and troubleshooting for either the Fluorotracer Analyzer or the Helium Mass Spectrometer Systems. Second day instruction includes "hands on" field-testing. For the establishment of a Leak Detection Program at your site, use our Consulting Services.







# ALKASERTS® TUBE INSERTS AND CONCO PLUGS

**Bring new life to older condensers and heat exchangers with these rejuvenating inserts and performance-proven plugs.**

Widely used in electric utility power stations, industrial power plants, processing facilities and onboard ships – wherever inlet end erosion and impingement present a problem – Conco Alkaserts polyethylene plastic inserts are designed to assure lasting protection to the inlet ends of new tubes and to greatly prolong the life of worn tubes damaged by erosion and impingement.

The Conco line of industry-leading tube plugs is second to none. We offer a wide selection of tube plugs in different styles, materials and sizes to match your specific requirements. Whether you need a temporary or permanent tube plug or one that can handle vibrations, high temperatures or extreme pressures, Conco has you covered.



## Alkaserts – Industrial Grade Polyethylene Tube Inserts

Conco Alkaserts are inert, highly resistant to abrasion and erosion, and are unaffected by chemical treatment programs. They are dimensionally stable to 170° F, well above normal operating temperatures of steam condensers, and have a negligible effect on heat transfer. While their feathered edge design allows for the smooth flow of cooling water into the tubes, their minimum wall thickness and tapered design promotes maximum flow. Flexible enough to accommodate normal variations in tube bores, yet rigid enough for easy installation, these rugged inserts are designed to make a snug fit in the tube. Once in place, there is no danger of water seeping between the insert and tube preventing crevice corrosion.



## Two Head Designs

Alkaserts are available in two head styles, bonnet and flush. While the bonnet head is designed to cover the ferrule in ferrule-type installations, the flush head is used for flush, rolled-in tubes and close-clearance tubesheet designs.



**Bonnet Head**



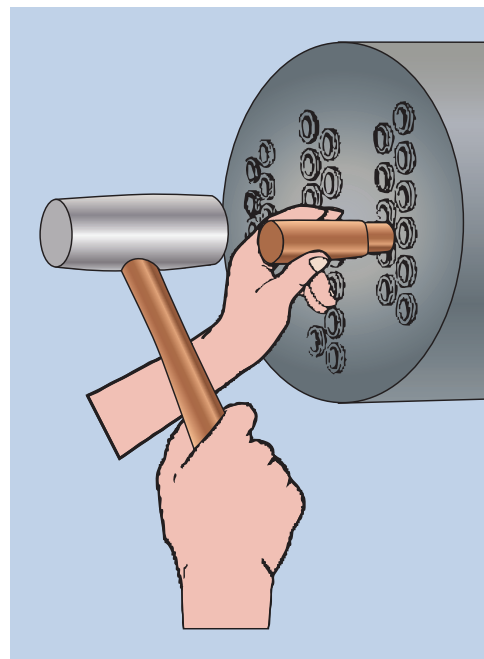
**Flush Head**

## Features

- Abrasion and erosion resistant providing lasting protection
- Negligible effect on heat transfer
- Flexible, sturdy construction
  - Unaffected by chemical treatment programs
  - Dimensionally stable to 170° F
  - Designed for maximum flow

## Easy Installation

Alkaserts are quick to install. After inserting an Alkasert into a tube, simply tap it home with a wooden or Micarta “persuader,” using light, sharp blows of a light mallet. That’s it, no adhesives or power tools. Compression and friction will hold the Alkasert permanently in place.



**Alkaserts Installation with a “Persuader” and a Light Mallet**

**ALK-B** Alkasert Polyethylene Tube Insert with bonnet head

**Call for Quantity Discounts and Prices**

**ALK-F** Alkasert Polyethylene Tube Insert with flush head

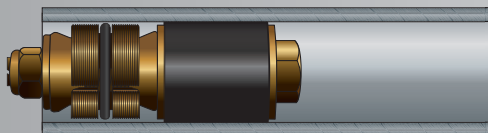
**Call for Quantity Discounts and Prices**





## High Confidence Tube Plugs

When you have to plug off leaking tubes in condensers and heat exchangers, the Conco patented High Confidence Tube Plugs are "Absolutely the Best" plugs you can use! Tested at pressures in excess of 1,000 PSI and available in 3/4" to 1 1/4" O.D. tube sizes, these tube plugs offer a separate gripping and sealing design in one plug, will not move into or out of leaking tubes, and can be used on coated or epoxied tubesheets.



### Features

- Separate gripping and sealing design in one plug
- Tested to over 1,000 PSI under wide range of temperature and vibration
- Grip made of machined serrated adjustable cleats allowing for positive gripping action
- Durable, expanding chloroprene cylinder provides dependable sealing action
- Available with metal components in titanium, stainless steel, brass and bronze



HC High Confidence Tube Plug

Call for Price

## Expanding Tube Plugs

For temporary or permanent plugging of 5/8" to 1 1/4" O.D. condenser and heat exchanger tubes, Conco's line of Expanding Tube Plugs are tested to withstand a wide range of pressure, temperature and vibration conditions. The larger washer on the end of the EX-3 Tube Plug allows the plug to fit flush with the tubesheet and not be pulled into the tube by the vacuum of the unit. The EX-4 Tube Plug is designed to be placed inside the tube at exact locations, to enable leak detection tests of other tubes. These plugs can resist pressures up to 150 PSI. The EX-F Tube Plug offers a separate gripping and sealing design in one plug and seals to 400 PSI.

### Features

- Installation is quick and easy
- Chloroprene cylinder material expands to seal tube
- Available with metal components in titanium, stainless steel, brass and bronze



EX-3 Expanding Tube Plug  
EX-4 Expanding Tube Plug  
EX-F Expanding Tube Plug

Call for Price  
Call for Price  
Call for Price

## Fiber Tube Plugs

Easily installed for emergency and temporary plugging of condenser and heat exchanger tubes, the Conco Fiber Tube Plug expands when wet to effectively seal off the tube. These one-piece plugs will not damage tubesheets and can be used in temperatures up to 230° F. They are available for plugging tubes 5/8" to 1 1/4" O.D.

### Features

- Made of vulcanized cloth fiber rod
- Machined to fit specific tube sizes
- Only a hammer needed for quick, easy installation



FP Fiber Tube Plug

Call for Price

## Pin, and Pin and Collar Tube Plugs

The one-piece tapered design of the Type-1 Pin Tube Plug fits specific tube sizes. The Type-2 Pin and Collar Tube Plug features a two-piece design with a matching tapered pin and collar for a positive full-length seal. Both types of tube plugs seal at high temperatures and isolate leaking tubes from the system, allowing continued use of the unit without major overhaul. They are available for plugging tubes 5/8" to 1 1/4" O.D. and are ideal for plugging tubesheets where tube samples have been extracted.

### Features

- Available in titanium, stainless steel, brass, and bronze
- Special materials available on request
- Can be machined to your drawing specifications



TYPE-1 Pin Tube Plug  
TYPE-2 Pin and Collar Tube Plug

Call for Price  
Call for Price





# TUBE SIZE AND CLEANER SELECTION GUIDE

Find your TruFit™ with Conco's state-of-the art tube cleaners, and start on your path to TotalPerformance™!

Conco's line of advanced, industry leading tube cleaners featuring TruFit™ technology can be sized to your exact specifications. They come standard in a variety of popular sizes to match most condenser and heat exchanger tubes.

Got a unique tube size? Use the handy guides below to determine your tube data and call us for recommendations on the best tube cleaner for your site specific application.



## Inches

### Tube Gauge in BWG / Tube Thickness in Inches

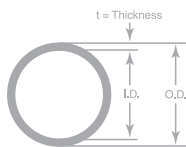
O.D. of Tube	12 0.109	13 0.095	14 0.083	15 0.072	16 0.065	17 0.058	18 0.049	19 0.042	20 0.035	21 0.032	22 0.028	23 0.025	24 0.022	25 0.020
mm    in	Tube I.D. in Inches													
12.70    1/2	0.282	0.310	0.334	0.356	0.370	0.384	0.402	0.416	0.430	0.436	0.444	0.450	0.456	0.460
15.88    5/8	0.407	0.435	0.459	0.481	0.495	0.509	0.527	0.541	0.555	0.561	0.569	0.575	0.581	0.585
19.05    3/4	0.532	0.560	0.584	0.606	0.620	0.634	0.652	0.666	0.680	0.686	0.694	0.700	0.706	0.710
22.23    7/8	0.657	0.685	0.709	0.731	0.745	0.759	0.777	0.791	0.805	0.811	0.819	0.825	0.831	0.835
25.40    1	0.782	0.810	0.834	0.856	0.870	0.884	0.902	0.916	0.930	0.936	0.944	0.950	0.956	0.960
28.58    1 1/8	0.907	0.935	0.959	0.981	0.995	1.009	1.027	1.041	1.055	1.061	1.069	1.075	1.081	1.085
31.75    1 1/4	1.032	1.060	1.084	1.106	1.120	1.134	1.152	1.166	1.180	1.186	1.194	1.200	1.206	1.210
34.93    1 3/8	1.157	1.185	1.209	1.231	1.245	1.259	1.277	1.291	1.305	1.311	1.319	1.325	1.331	1.335
38.10    1 1/2	1.282	1.310	1.334	1.356	1.370	1.384	1.402	1.416	1.430	1.436	1.444	1.450	1.456	1.460

## Millimeters

### Tube Gauge in BWG / Tube Thickness in Millimeters

O.D. of Tube	12 2.77	13 2.41	14 2.11	15 1.83	16 1.65	17 1.47	18 1.24	19 1.07	20 0.89	21 0.81	22 0.71	23 0.64	24 0.56	25 0.51
in    mm	Tube I.D. in Millimeters													
1/2    12.70	7.16	7.88	8.48	9.04	9.40	9.76	10.22	10.56	10.92	11.08	11.28	11.42	11.58	11.68
5/8    15.88	10.34	11.05	11.66	12.22	12.57	12.93	13.39	13.74	14.10	14.25	14.45	14.61	14.76	14.86
3/4    19.05	13.51	14.22	14.83	15.39	15.75	16.10	16.56	16.92	17.27	17.42	17.63	17.78	17.93	18.03
7/8    22.23	16.69	17.40	18.01	18.57	18.92	19.28	19.74	20.09	20.45	20.60	20.80	20.96	21.11	21.21
1    25.40	19.86	20.57	21.18	21.74	22.10	22.45	22.91	23.27	23.62	23.77	23.98	24.13	24.28	24.38
1 1/8    28.58	23.04	23.75	24.36	24.92	25.27	25.63	26.09	26.44	26.80	26.95	27.15	27.31	27.46	27.56
1 1/4    31.75	26.21	26.92	27.53	28.09	28.45	28.80	29.26	29.62	29.97	30.12	30.33	30.48	30.63	30.73
1 3/8    34.93	29.39	30.10	30.71	31.27	31.62	31.98	32.44	32.79	33.15	33.30	33.50	33.66	33.81	33.91
1 1/2    38.10	32.56	33.27	33.88	34.44	34.80	35.15	35.61	35.97	36.32	36.47	36.68	36.83	36.98	37.08





O.D.	BWG	t	I.D.	C4S	C3S	C2X	C3X	C4SS	BUS	H	XL	XXL	P	C2S	U	QTB
5/8"	16	0.065"	0.495"	●						●	●		●	●	●	●
0.625"	17	0.058"	0.509"	●						●	●		●	●	●	●
0.625"	18	0.049"	0.527"	○						○	○		○	○	○	○
0.625"	19	0.042"	0.541"	●						●	●		●	●	●	●
0.625"	20	0.035"	0.555"	●						●	●		●	●	●	●
0.625"	21	0.032"	0.561"	●						●	●		●	●	●	●
0.625"	22	0.028"	0.569"	●						●	●		●	●	●	●
3/4"	16	0.065"	0.620"	●		●	●	●	●	●	●		●	●	●	●
0.750"	17	0.058"	0.634"	●		●	●	●	●	●	●		●	●	●	●
0.750"	18	0.049"	0.652"	○		○	○	○	○	○	○		○	○	○	○
0.750"	19	0.042"	0.666"	●		●	●	●	●	●	●		●	●	●	●
0.750"	20	0.035"	0.680"	●		●	●	●	●	●	●		●	●	●	●
0.750"	21	0.032"	0.686"	●		●	●	●	●	●	●		●	●	●	●
0.750"	22	0.028"	0.694"	●		●	●	●	●	●	●		●	●	●	●
7/8"	16	0.065"	0.745"	●	●	●	●	●	●	●	●	●	○	●	●	●
0.875"	17	0.058"	0.759"	●	●	●	●	●	●	●	●	●	○	●	●	●
0.875"	18	0.049"	0.777"	○	○	○	○	○	○	○	○	○	○	○	○	○
0.875"	19	0.042"	0.791"	●	●	●	●	●	●	●	●	●	○	●	●	●
0.875"	20	0.035"	0.805"	●	●	●	●	●	●	●	●	●	○	●	●	●
0.875"	21	0.032"	0.811"	●	●	●	●	●	●	●	●	●	○	●	●	●
0.875"	22	0.028"	0.819"	●	●	●	●	●	●	●	●	●	○	●	●	●
1"	16	0.065"	0.870"	●	●	●	●	●	●	●	●	●	○	●	●	●
1.000"	17	0.058"	0.884"	●	●	●	●	●	●	●	●	●	○	●	●	●
1.000"	18	0.049"	0.902"	○	○	○	○	○	○	○	○	○	○	○	○	○
1.000"	19	0.042"	0.916"	●	●	●	●	●	●	●	●	●	○	●	●	●
1.000"	20	0.035"	0.930"	●	●	●	●	●	●	●	●	●	○	●	●	●
1.000"	21	0.032"	0.936"	●	●	●	●	●	●	●	●	●	○	●	●	●
1.000"	22	0.028"	0.944"	●	●	●	●	●	●	●	●	●	○	●	●	●
1 1/8"	16	0.065"	0.995"	●		●	●	●	●	●	●	●	○	●	●	●
1.125"	17	0.058"	1.009"	●		●	●	●	●	●	●	●	○	●	●	●
1.125"	18	0.049"	1.027"	○		○	○	○	○	○	○	○	○	○	○	○
1.125"	19	0.042"	1.041"	●		●	●	●	●	●	●	●	○	●	●	●
1.125"	20	0.035"	1.055"	●		●	●	●	●	●	●	●	○	●	●	●
1.125"	21	0.032"	1.061"	●		●	●	●	●	●	●	●	○	●	●	●
1.125"	22	0.028"	1.069"	●		●	●	●	●	●	●	●	○	●	●	●
1 1/4"	16	0.065"	1.120"	●				●	●	●	●	●	○	●	●	●
1.250"	17	0.058"	1.134"	●				●	●	●	●	●	○	●	●	●
1.250"	18	0.049"	1.152"	○		○	○	○	○	○	○	○	○	○	○	○
1.250"	19	0.042"	1.166"	●		●	●	●	●	●	●	●	○	●	●	●
1.250"	20	0.035"	1.180"	●		●	●	●	●	●	●	●	○	●	●	●
1.250"	21	0.032"	1.186"	●		●	●	●	●	●	●	●	○	●	●	●
1.250"	22	0.028"	1.194"	●		●	●	●	●	●	●	●	○	●	●	●

**Note:** For metric tube sizes, calculate the equivalent diameter in inches and use the nearest size cleaner.  
 To convert metric to inches: multiply millimeters x 0.03937. For example: 20 mm = 20 x 0.03937 = 0.7874" I.D.  
 This tube size takes a Conco cleaner Type C3S for 7/8" O.D. x 19 BWG tube.

**Note:** Additional sizes and gauges available.





**Conco Services Corp.**  
530 Jones Street  
Verona, PA 15147

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