

# Burr Tool

**GLOBAL EXPERIENCE. LOCAL SOLUTIONS.**

Providing quality machines, tools and expertise to the heat transfer and tube processing industries for over 70 years.

[www.burroak.com](http://www.burroak.com)



**Newell A. Franks II**  
Chairman, CEO

**Brian McConnell**  
President



## **BURR OAK TOOL INC.**

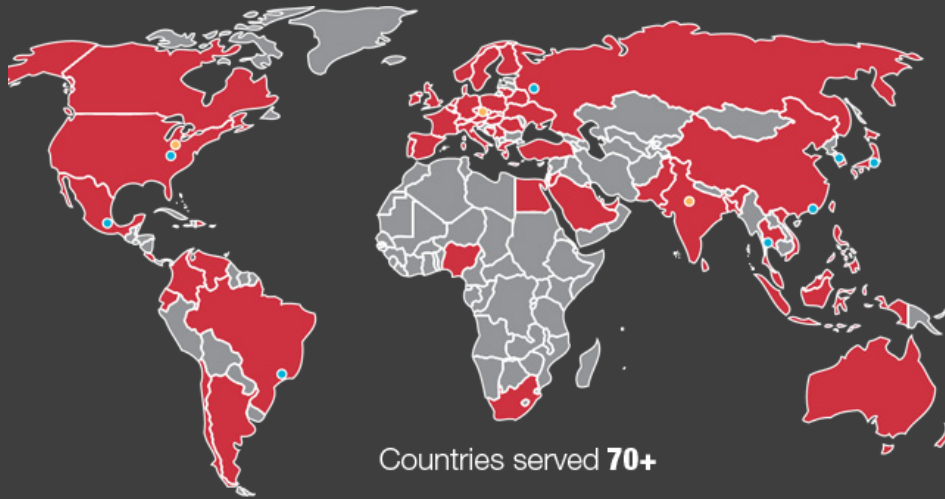
GLOBAL EXPERIENCE...LOCAL SOLUTIONS

Burr OAK Tool Inc. was established in 1944 in Burr Oak, Michigan, USA. It was founded by a small group of men who had a vision to provide tools, dies and fixtures to local companies. Burr OAK has remained family owned for three generations, and retains the same roots and values instituted by Newell A. Franks, one of the original founders.

For over 70 years, Burr OAK Tool has provided machines, tools, and expertise to the heat transfer and tube processing industries. World class facilities house the manufacturing and assembly operations, and our dedicated employees settle for nothing less than excellence.

Our goal is to provide safe, accurate, and cost effective solutions to your specific production requirements.





To assist our customers in their immediate service requirements, we draw from a large, highly trained and experienced staff of technicians and engineers.

We also have service centers in China, India, and Europe enhancing our ability to provide personnel anywhere in the world on very short notice, minimizing expensive interruption of your production schedule.

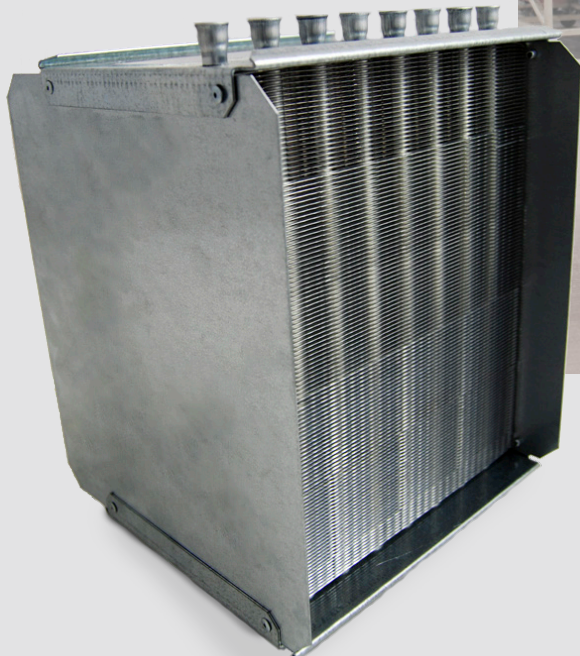
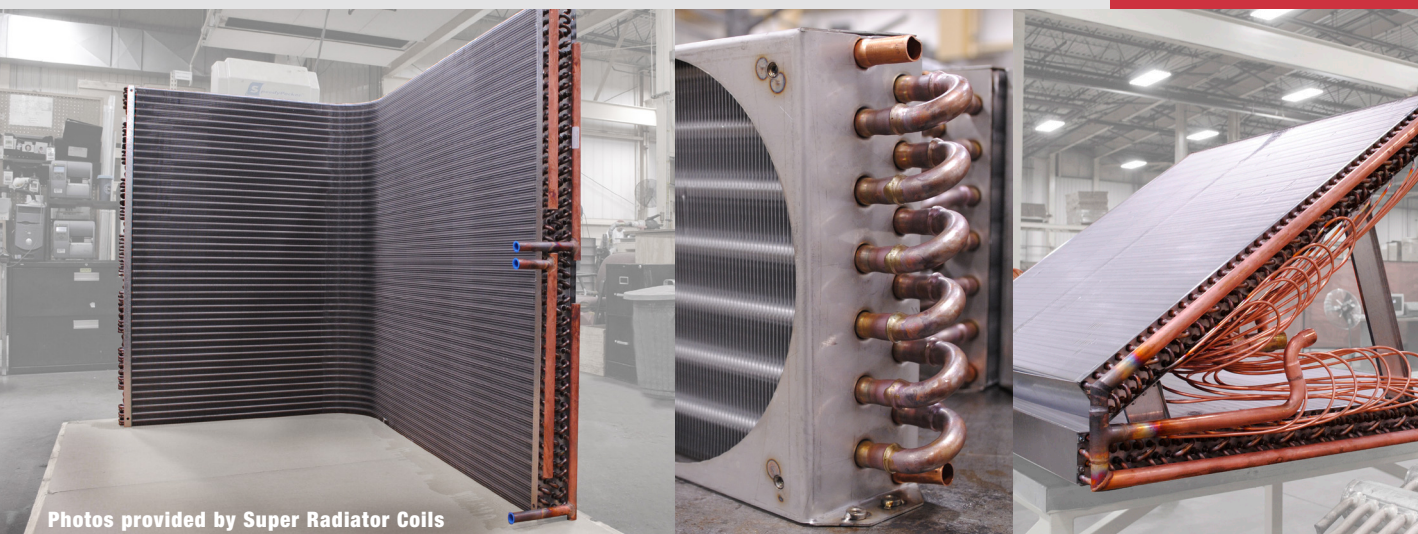


Photo provided by Super Radiator Coils





Photos provided by Super Radiator Coils

## Who We Are

For over 70 years Burr OAK Tool Inc. has delivered machines, tools, and expertise to the world's heat exchanger manufacturers and tube processing industries. Heat exchangers are an integral part of air conditioning, heating, refrigeration, and air handling units. Plumbing, appliance, automotive, and tube component producers use OAK tube processing machinery and tooling.

Our focus is to provide effective solutions to customers worldwide by delivering quality machines, service, and replacement parts.

## What We Deliver

Burr OAK Tool Inc. designs and produces high quality fin dies, fin lines, tube expanders, tube cutoff machines, tube bending equipment, and coil forming units for companies in over 75 countries.

We guarantee that our machines are finished, thoroughly tested, and most importantly, will function properly upon installation in your factory and throughout its production history.

## What's Our Emphasis

We will work with our clients to find cost effective and timely solutions to the production challenges that they face on a day-to-day basis.

Using our machinery and tools helps our clients meet or exceed their production requirements, increasing their success and profitability.

## Strength in People

Burr OAK Tool Inc.'s experienced and dedicated workforce innovates to meet and anticipate our customers' needs.

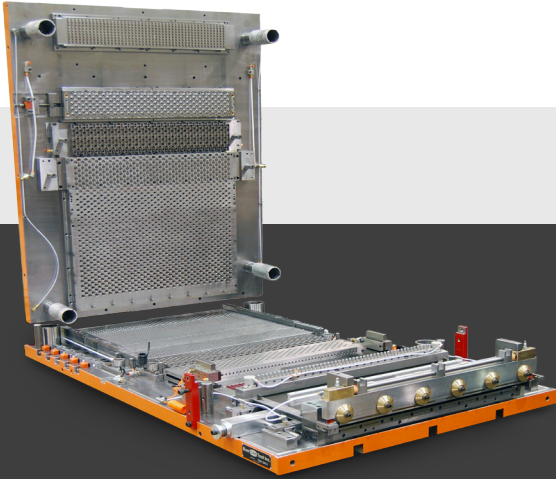
To enhance our international presence, we have carefully selected and qualified OAK sales partners in Thailand, China, Brazil, India, Mexico, Japan, Korea, Russia and Czech Republic.

“ I have been doing business with Burr OAK for well over 30 years working for five different companies. Burr OAK is one of the most innovative, dynamic companies that I have worked with and has the resources to meet all of their customers' needs. They are the largest and most reliable heat transfer equipment company in the entire world. They are the reason that the HVAC business is the success that it is today.”

**RT, Operations Planning**

# OAK FIN DIES

Built for Accuracy, Speed, Longevity and Reliability



## OAK FIN DIES

Burr OAK Tool Inc. has been the industry leader in designing and building fin dies since the early 1960s. Our engineers work closely with you to design and build your fin die to meet your specific heat transfer requirements. The dies can be equipped with rapid die change options to provide more flexible and accurate production capabilities.

Fin dies designed and manufactured by Burr OAK Tool are consistent. They are able to maintain close tolerances and perform within the demanding specifications required by intricate fin design. OAK fin dies are dependable, both in creating quality fins each stroke of the press, and in producing superb product for many years.

## STANDARD FIN FORMS

- Plain / Flat
- V-Waffle
- Modified V-Waffle
- Sine Wave
- Modified Sine Wave

## SPECIAL FIN FORMS

- Dog-Bone
- Tab Spaced
- Flat Tube
- Ribbed

## SPECIAL FIN COLLARS

- Starburst
- Elliptical
- Oval



Starburst Fin



V-Waffle Fin



Drawless Fin

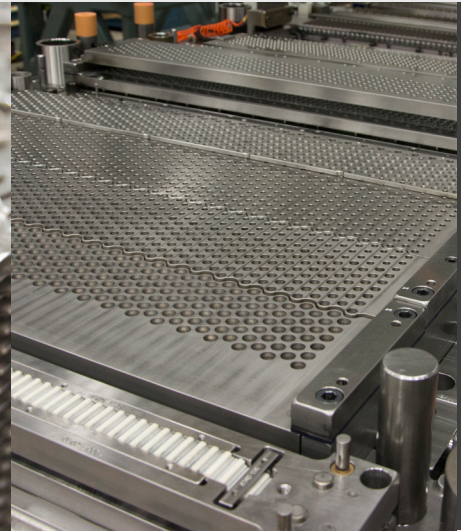
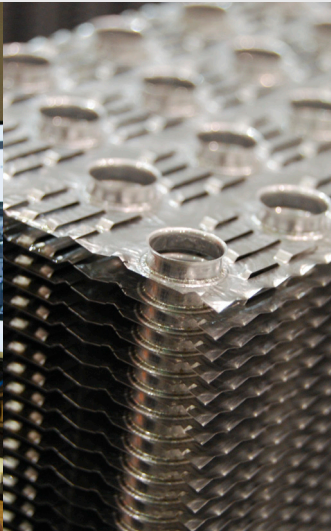
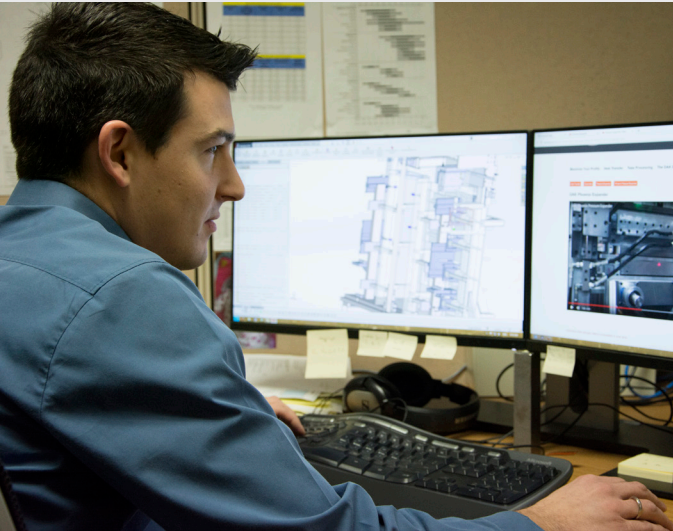


Dogbone



# OAK FIN DIES

Built for Accuracy, Speed, Longevity and Reliability



## DIE TYPES

Standard Draw Type:

Progressively stretches and reforms through a series of draws

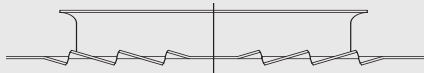
Drawless Die - Triple Extrude:

Progressively extrudes and irons (reduces thickness) as it forms the collar

## ENHANCEMENTS

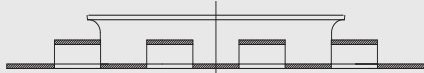
Louver:

Sections cut and rotated away from stock



Lance:

Sections are cut and moved vertically away from stock



Small Diameter (5 mm)

## Economic Advantages

- Highly accurate dies mean more product per square foot of stock and less scrap.
- Achieve tooling cost savings through flexible die design. A single die is capable of meeting a large range of fin design requirements with various collar spacings, stock widths and material types.
- Hydraulic slit selector clamps (gagable tooling) allow row selections to be made by one operator versus two to make a change in a shorter time.
- Tooling can be manufactured from special tool steels for longer tool life, minimizing sharpening requirements. This means less production downtime.

## Technical Advantages

- Flexible die design can provide collars up to 1½ fins per 25.4 mm.
- Adjustable reflare station provides accurately controlled fin stack height.
- Auto draw and reflare adjustment is available.
- Auto slit select up to 6-positions with hydraulic slit clamp is available.
- Available hydraulic slit clamps provide a positive, locked position throughout operation — eliminating hand screws.

## User Advantages

- Auto slit select and hydraulic slit clamp allows for safer changeover because guards remain in place — eliminating the need to open guards and enter the machine.
- The clamps provide a positive locked position, and the auto slit selection provides location — all operated from the operator touch screen controls.





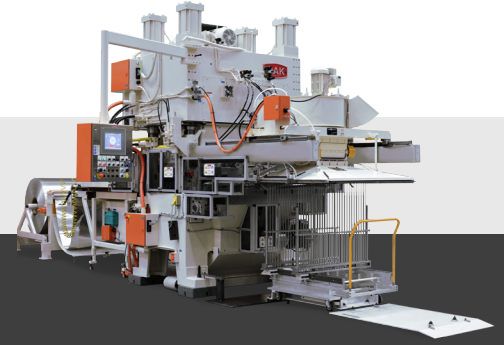
## OAK FP-400 FIN LINE

The OAK FP-400 fin line provides a reliable, cost effective fin making solution.



## OAK FP-2B FIN LINE

The OAK FP-2 fin production line serves as an ideal fin making solution when intricate fin patterns are required.



## OAK FP-1000 FIN LINE

This fin production line provides enough stamping power for the most demanding fin designs, while remaining flexible for quick die change options.

### TONNAGE

45 Tons Force (US)  
400 kN

### PRODUCTION

160 to 400 SPM\*  
using a 2 or 4 progression fin die  
\*Application Dependent

### FOOTPRINT

≈ 2.5 m x 6.5 m  
≈ 8' x 21.5'

### MAXIMUM FIN LENGTH

60" (1,524 mm)

### MAXIMUM FIN WIDTH

13" (330 mm)

### SHUT HEIGHT

9" (228 mm) to 11" (304 mm)

### STANDARD STROKE

1½" (40 mm) to 2" (51 mm)

### TONNAGE

60 Tons Force (US)  
534 kN

### PRODUCTION

160 to 300 SPM\*  
using a 2 or 4 progression fin die  
\*Application Dependent

### FOOTPRINT

≈ 3.7 m x 10.1 m  
≈ 12' x 33'

### MAXIMUM FIN LENGTH

108" (2,742 mm)

### MAXIMUM FIN WIDTH

19" (480 mm) for 36" (914 mm) press  
31" (785 mm) for 48" (1,219 mm) press

### SHUT HEIGHT

9" (229 mm) to 13" (330 mm)

### STANDARD STROKE

1" (25 mm) to 2" (51 mm)

### TONNAGE

112 Tons Force (US)  
1,000 kN

### PRODUCTION

160 to 400 SPM\*  
using a 2, 4, or 6 progression fin die  
\*Application Dependent

### FOOTPRINT

≈ 3.7 m x 10.1 m  
≈ 12' x 33'

### MAXIMUM FIN LENGTH

108" (2,742 mm)

### MAXIMUM FIN WIDTH

37" (940 mm)

### SHUT HEIGHT

9" (229 mm) to 13" (330 mm)

### STANDARD STROKE

1" (25 mm) to 2" (51 mm)

# OAK FIN LINES

Choosing the Press You Need



## OAK FP-1400 FIN LINE

The OAK FP-1400 is a high performance press and line for increased fin stamping capacity. Higher tensile fin stocks and larger fin dies won't deter or slow down the 1400.

## FIN PRODUCTION

It is extremely important to balance production needs with floor space limitations and capital equipment budget.

The collection of OAK presses and fin line component options allow combinations that provide an optimal arrangement. OAK sales professionals will help you clearly define the fin line that fulfills all of your needs.

## TONNAGE

160 Tons Force (US)  
1,400 kN

## PRODUCTION

160 to 400 SPM\*  
using a 2, 4, or 6 progression fin die  
\*Application Dependent

## FOOTPRINT

≈ 3.7 m x 10.1 m  
≈ 12' x 33'

## MAXIMUM FIN LENGTH

108" (2,742 mm)

## MAXIMUM FIN WIDTH

37" (940 mm)

## SHUT HEIGHT

9" (230 mm) to 13" (330 mm)

## STANDARD STROKE

1" (25 mm) to 2" (51 mm)

## SAMPLE TONNAGE REQUIREMENTS

5mm O.D. X 19.05mm x 11.4mm

Raised Lance On Flat Surface, 1.2mm Collar Height

1100 Alloy, H22 Hardness, 0.1mm Material Thickness

PRESS LINE:	400	2B-36	2B-48	1000	1400
Progressions	2	2	2	4	6
Rows	30	48	72	72	72
Tonnage Required	21	34	51	100	149

### Number of fins produced in one minute @ 260 SPM:

2 rows x 24 holes	325	520	780	1,560	2,340
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7 mm OD, 21 mm x 12.7 mm

Raised Lance on Flat Surface, 1.5 mm Collar Height,

8011 AL Alloy, H26 Hardness, 0.11 mm Material Thickness

PRESS LINE:	400	2B-36	2B-48	1000	1400
Progressions	2	4	4	4	4
Rows	24	30	30	48	72
Tonnage Required	22	55	55	88	132

### Number of fins produced in one minute @ 260 SPM:

2 rows x 24 holes	260	650	650	1,040	1,560
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# OAK FIN PRESS | FP-400

Quality Production at an Affordable Price

## OAK FP-400 FIN LINE

The OAK FP-400 fin production line provides a reliable, cost effective fin making solution. This 45 ton (400kN), straight side style press and line consistently produces quality fins. From reliable stock feed to damage-free fin collection, design elements lead to quality parts and longer tool life.

### PRODUCTION

160 to 400 SPM  
using a 2 or 4 progression fin die

\*Application Dependent

### FOOTPRINT

≈ 2.5 m x 6.5 m  
≈ 8' x 21.5'

### WEIGHT

≈ 4,600 kg  
≈ 10,141 lbs

### AIR

60 ft<sup>3</sup>/min at 85 psi  
(1.7 m<sup>3</sup>/min at 5.51 bar)

### POWER

15 kW @ .80/.82 PF  
24 VDC Controls

\*\*Foundation information supplied upon request





# OAK FIN PRESS I FP-400

Quality Production at an Affordable Price



## MAXIMUM FIN LENGTH

60" (1,524 mm)

## MAXIMUM FIN WIDTH

13" (330 mm)

## SHUT HEIGHT

9" (228 mm) to 11" (304 mm)

## STANDARD STROKE

1½" (40 mm) to 2" (51 mm)

The FP-400 press series has a bed size of 32" X 30" (813 mm x 762 mm)

## Economic Advantages

- OAK's least expensive fin press and line.
- Reduced die and stacker tooling investment.
- Multiple dies allow the fin line to be used for a wide range of product.

## Technical Advantages

- Hydraulic withdrawal feature allows routine maintenance without removing the die from the press.
- Hydro-dynamic bearing reduces adjustments and adds stability.
- Fast, safe and efficient fin die removal.
- Can be modified to allow a maximum stroke length of 3" (76 mm) if necessary.

## User Advantages

- Interior of die is easy to reach for tooling inspection and maintenance.
- Program the fin length from the touch screen control panel.
- Operator touch screen controls can be configured for different languages.



# OAK FIN PRESS | FP-2B

Flexible, High Quality Production at a Mid-range Price

## OAK FP-2B FIN LINE

The OAK FP-2B fin production line serves as an ideal fin making solution when intricate fin patterns are required.

Rated at 60 tons (534kN), the four post press and supporting line equipment deliver the fin stock to the press, where it is lubricated, stamped and the final product is efficiently collected.

### PRODUCTION

160 to 300 SPM  
using a 2 or 4 progression fin die

\*Application Dependent

### FOOTPRINT

≈ 3.7 m x 10.1 m  
≈ 12' x 33'

### WEIGHT

≈ 7,600 kg  
≈ 16,755 lbs

### AIR

60 ft<sup>3</sup>/min at 85 psi  
(1.7 m<sup>3</sup>/min at 5.51 bar)

### POWER

29 kW @ .80/.82 PF  
24 VDC Controls

\*\*Foundation information supplied upon request





# OAK FIN PRESS | FP-2B

Flexible, High Quality Production at a Mid-range Price



## MAXIMUM FIN LENGTH

108" (2,742 mm)

## MAXIMUM FIN WIDTH

19" (480 mm) for 36" (914 mm) press  
31" (785 mm) for 48" (1,219 mm) press

## SHUT HEIGHT

9" (229 mm) to 13" (330 mm)

## STANDARD STROKE

1" (25 mm) to 2" (51 mm)

The FP-2B press series has bed sizes of 34" x 34" (864 mm x 864 mm) and 46" x 34" (1,168 mm x 864 mm).

## Economic Advantages

- 60 ton press produces mid level production volumes.
- Flexible production capabilities.
- Can accommodate various die designs.

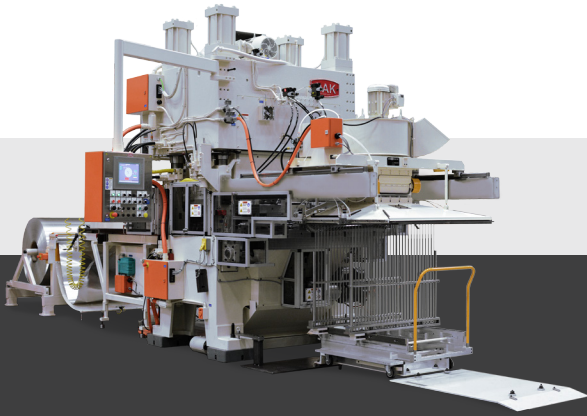
## Technical Advantages

- Hydraulic withdrawal feature allows routine maintenance without removing the die from the press.
- Programmable Logic Controller (PLC) stops fin production automatically when a predetermined number of fins have been stacked.
- Damage-free fin collection system.
- Faster die removal than the competition.

## User Advantages

- Can be modified to allow a maximum stroke length of 3" (76 mm) if necessary.
- Program the fin length from the touch screen control panel.
- Operator touch screen controls can be configured for different languages.





# OAK FIN PRESS | FP-1000

The Standard for High Production

## OAK FP-1000 FIN LINE

The OAK FP-1000 fin production line provides a high production solution for manufacturing quality fins. This 112 ton (1,000kN) rated press provides enough stamping power for the most demanding fin designs, while remaining flexible for quick die change options. The line features new elements in stock feeding, lubrication and fin collection all geared toward ease of operation and increased productivity.

### PRODUCTION

160 to 400 SPM  
using a 2, 4, or 6 progression fin die  
\*Application Dependent

### FOOTPRINT

≈ 3.7 m x 10.1 m  
≈ 12' x 33'

### WEIGHT

≈ 15,200 kg  
≈ 33,510 lbs

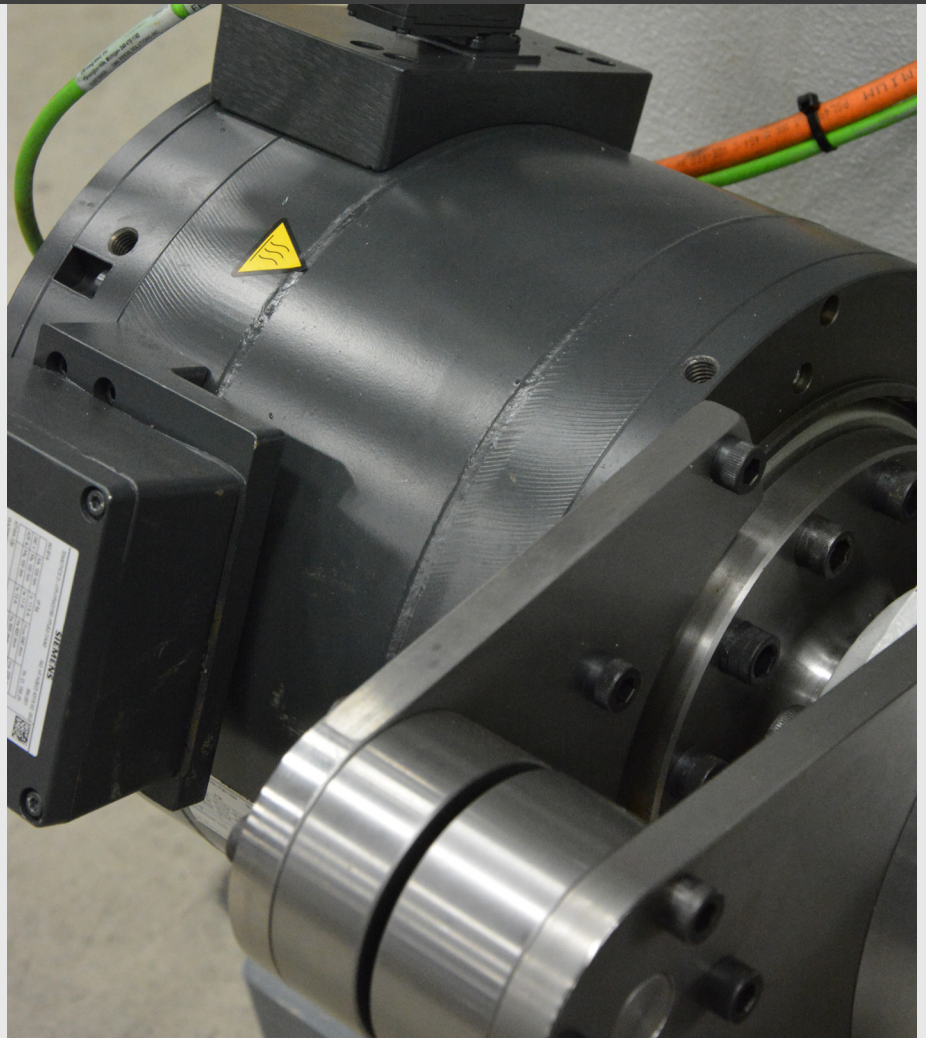
### AIR

120 ft<sup>3</sup>/min at 85 psi  
(3.4 m<sup>3</sup>/min at 5.51 bar)

### POWER

64 kW @ .80/.82 PF  
24 VDC Controls

\*\*Foundation information supplied upon request



# OAK FIN PRESS | FP-1000

The Standard for High Production



## MAXIMUM FIN LENGTH

108" (2,742 mm)

## MAXIMUM FIN WIDTH

37" (940 mm)

## SHUT HEIGHT

9" (229 mm) to 13" (330 mm)

## STANDARD STROKE

1" (25 mm) to 2" (51 mm)

The FP-1000 press series has a bed size of 54" X 48" (1372 mm x 1219 mm)

## Economic Advantages

- 112 ton press in a compact design saves space.
- High production capabilities.
- Dynamically balanced for less vibration, therefore reducing maintenance.
- Electronic feed reduces setup downtime thus increasing overall production.

## Technical Advantages

- 4-point load on slide ensures accurate load distribution to produce consistent fin dimensions across the die.
- Hydraulic withdrawal system allows routine maintenance without removing the die from the press.
- Adjustable shut height can be either hydraulic or mechanical.
- Programmable Logic Controller (PLC) stops fin production automatically when a predetermined number of fins have been stacked.

## User Advantages

- Can be modified to allow a maximum stroke length of 3" (76 mm) if necessary.
- Will operate high production fin dies.
- Electronic feed requires less training for operator competency.
- Perform maintenance without using a forklift or crane to remove the die from the press.
- Includes new features for stock feeding, lubrication and fin collection to increase ease of operation and productivity.
- Program the fin length from the touch screen control panel.
- Operator touch screen controls can be configured for different languages.





# OAK FIN PRESS | FP-1400

Big, Brawny, Balanced

## OAK FP-1400 FIN LINE

This high performance press and line for the heat transfer industry has a 160 ton (1,400kN) rating for increased fin stamping capacity. Extensive solid modeling performed in the design stage and added weight optimizes press rigidity.

The new electronic servo-feed allows easier access to the left side of the press and die, and centers and balances the forces on the feed shaft.

The dynamically balanced platform minimizes vibrations, ensuring accuracy even at higher press speeds. In almost any fin making application the 1400's size, strength and stability will increase capacity and improve performance.

### PRODUCTION

160 to 400 SPM  
using a 2, 4, or 6 progression die  
\*Application Dependent

### FOOTPRINT

≈ 3.7 m x 10.1 m  
≈ 12' x 33'

### WEIGHT

≈ 19,000 kg  
≈ 41,800 lbs

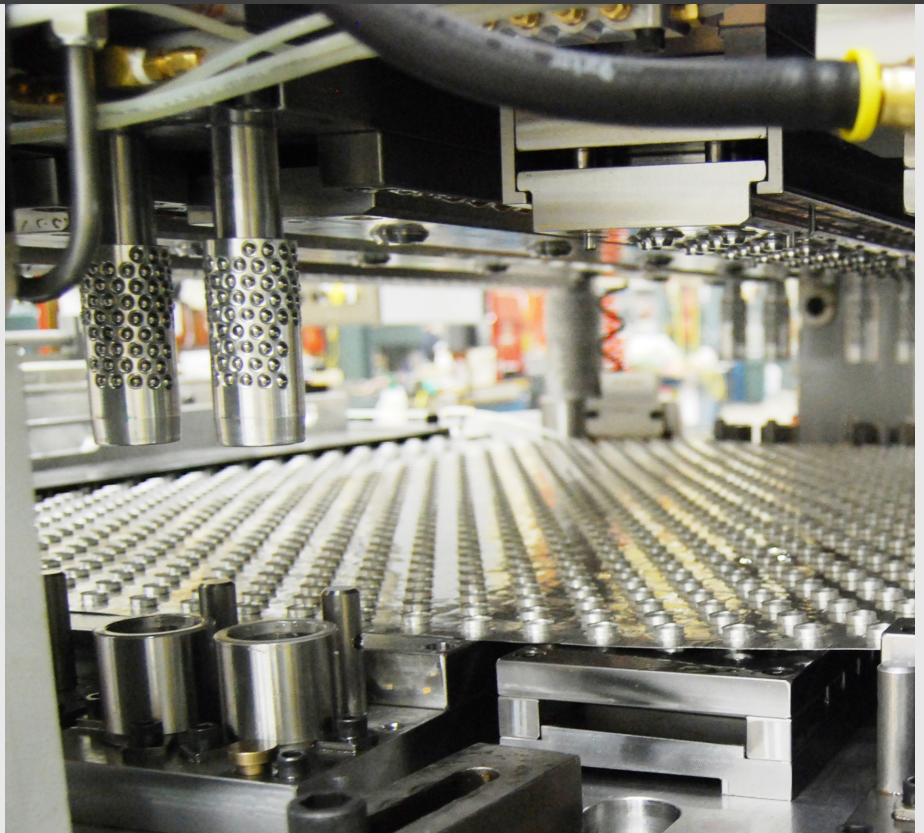
### AIR

120 ft<sup>3</sup>/min at 85 psi  
(3.4 m<sup>3</sup>/min at 5.51 bar)

### POWER

64 kW @ .80/.82 PF  
24 VDC Controls

\*\*Foundation information supplied upon request





# OAK FIN PRESS | FP-1400

Big, Brawny, Balanced



## MAXIMUM FIN LENGTH

108" (2,742 mm)

## MAXIMUM FIN WIDTH

37" (940 mm)

## SHUT HEIGHT

9" (230 mm) to 13" (330 mm)

## STANDARD STROKE

1" (25 mm) to 2" (51 mm)

The FP-1400 press series has a bed size of 54" X 48" (1372 mm x 1219 mm)

## Economic Advantages

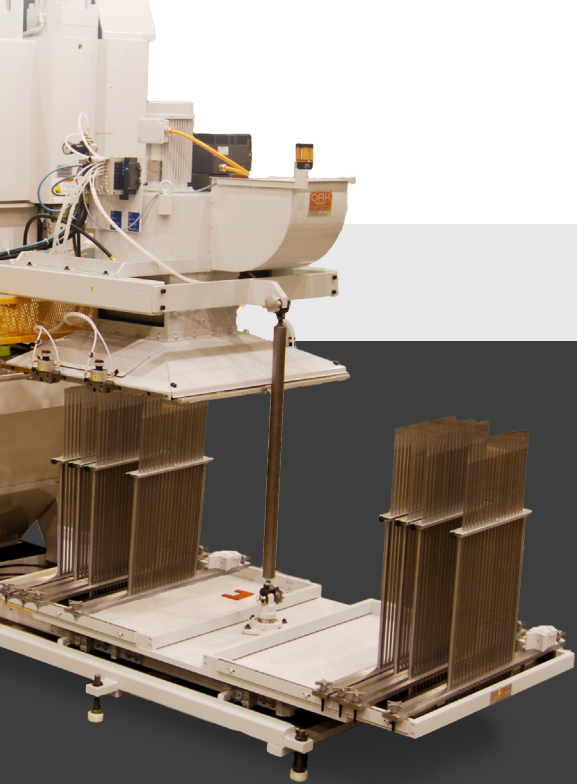
- Dynamically balanced for less vibration, therefore reducing maintenance.
- Electronic feed reduces setup downtime thus increasing overall production.
- 160 ton press provides higher production in a given floor space.

## Technical Advantages

- Electronic feed saves wear and tear on feed components.
- 4-point load on slide ensures accurate load distribution to produce consistent fin dimensions across the die.
- Hydraulic system for adjusting shut height allows flexibility in die designs.
- Hydraulic withdrawal system allows routine maintenance without removing the die from the press.
- Programmable Logic Controller (PLC) stops fin production automatically when a predetermined number of fins have been stacked.

## User Advantages

- Can be modified to allow a maximum stroke length of 3" (76 mm) if necessary.
- Electronic feed requires less training for operator competency.
- Perform maintenance without using a forklift or crane to remove the die from the press.
- Includes new features for stock feeding, lubrication and fin collection to increase ease of operation and productivity.
- Thicker and high tensile materials are easier to manipulate with the 160 ton press and will operate high production fin dies.
- Program the fin length from the touch screen control panel.



# OAK FIN LINE EQUIPMENT

Maximize Fin Handling

## OAK FIN LINE EQUIPMENT

The fin stock uncoiler, suction unit and stacker unit comprise the heart of the Burr OAK material handling system. Our line equipment features new elements in stock feeding and fin collection focusing on ease of operation and increased productivity.

### LUBRICATION SYSTEMS

Standard Dip Tank  
OAK E-Lube System

### DIE TAKEOUT SYSTEM

Available on all presses

### FIN SCRAP CONVEYOR

This option uses a conveyor system to collect the material discarded during press operation.

### FIN SUCTION UNIT

Standard Non-moving  
Tap Down Sheet

### FIN STACKING

OAK stacker systems can be configured in a number of different ways to best suit your production environment.

#### 2-Position Rotary Design

The rotary stacking system is available in both the standard and heavy duty designs depending on various production requirements. Either version will move a completed stack of fins from underneath the suction unit to a position where it can be manually unloaded. At the same time, an empty set of tooling is positioned under the suction unit so fin production can be safely continued with minimum interruption. Also available is an elevator option to aid in the location, stacking, and removal of fins with small diameter collars.

#### 2-Position Shuttle Design

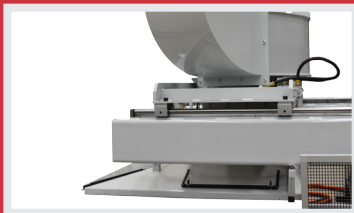
This stacker version moves the completed stack of fins from under the suction unit by traversing from left-to-right. As in the rotary version, an empty set of tooling is located under the suction unit at the same time for the most efficient production process.

#### Cart Stacker

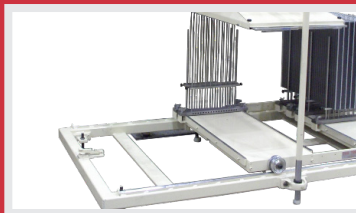
The cart version of stacker allows a completed stack of fins to be removed from under the suction unit and moved, as a unit, to the next stage of coil manufacturing or into inventory. An empty cart can then be accurately positioned, through the use of a nesting and locking plate, under the suction unit to allow fin production to continue with minimum interruption.



Die Takeout System



Suction Unit



Shuttle Stacker



Heavy Duty Stacker

# OAK FIN LINE EQUIPMENT

Maximize Fin Handling



## UNCOILER

The fin stock uncoiler was designed to supply the press with the raw material needed to produce a fin. Most of the material needed for this production comes in coil form and is loaded onto the uncoiler which then supplies a loop of stock to the lubrication system before entering the fin die.

OAK uncoilers come in single or double versions.

## Economic Advantages

- OAK line equipment is designed to feed raw material and properly present finished goods to keep the fin press and die operating at optimum speed, avoiding slowdowns or downtime of any sort.
- Variable speed options are available on all line equipment. Operator sets a consistent line speed to meet output needs without having to turn the line on and off.

## Technical Advantages

- Stacker rods are manufactured from hardened stainless steel to increase their life-cycle.
- Stacker rod stabilizers minimize vibration and increase the consistency of the stacking process.
- The newly designed “double delta” stacker rods are corrosive resistant, stronger, and electro-polished to help maximize fin stacking.

## User Advantages

- The press stops automatically when the raw material is exhausted.
- The press also stops automatically when the proper number of fins have been stacked.
- Fin stacking elevators raise fin stacks to facilitate unloading.
- All stacker designs allow the safe removal of stacks of fins while the press is in operation and loading the active station.



Double Uncoiler



# OAK E-LUBE SYSTEM

Efficient • Effective • Environmentally Friendly



## OAK E-LUBE SYSTEM

This new lubrication system is an innovative and economical solution to lubrication requirements. The controlled application provides smooth and consistent lubrication to the fin stock, which helps protect tooling and reduces waste. The system features controlled lubricant delivery to both sides of the stock using specialized felt application pads.

The OAK E-Lube is capable of applying lubricant coatings as low as 25 mg/ft<sup>2</sup> (269 mg/m<sup>2</sup>), and is an ideal solution for applications where proper lubrication is critical.

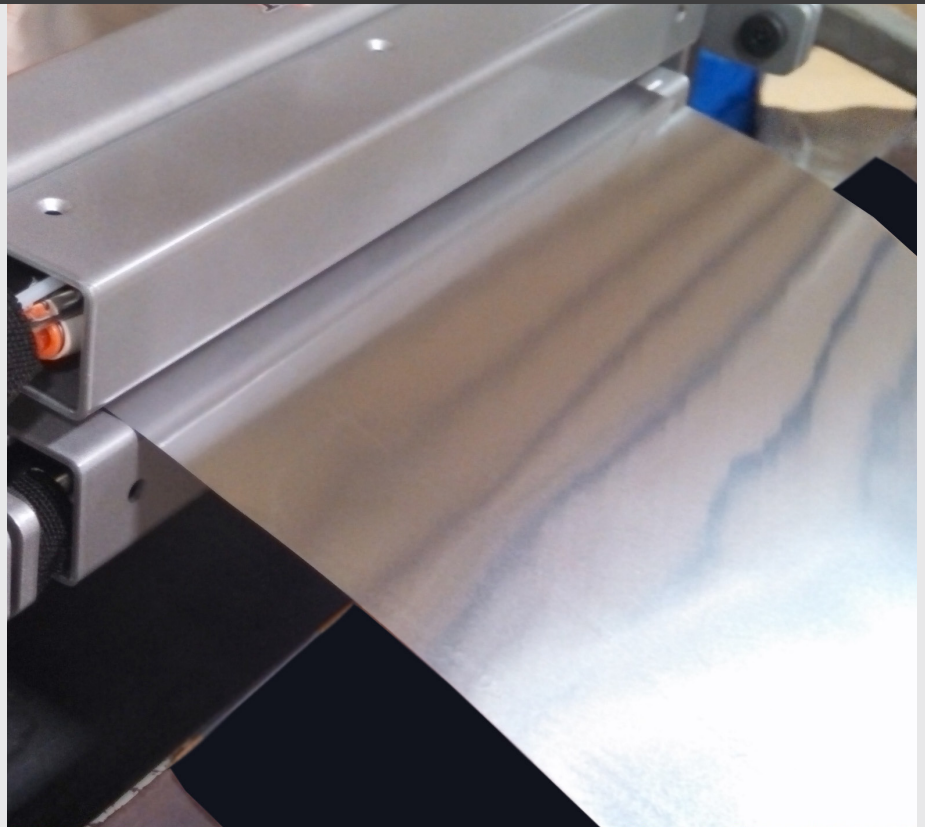
## LUBRICANT

Lubricant from Metalloid is highly recommended by Burr OAK Tool.



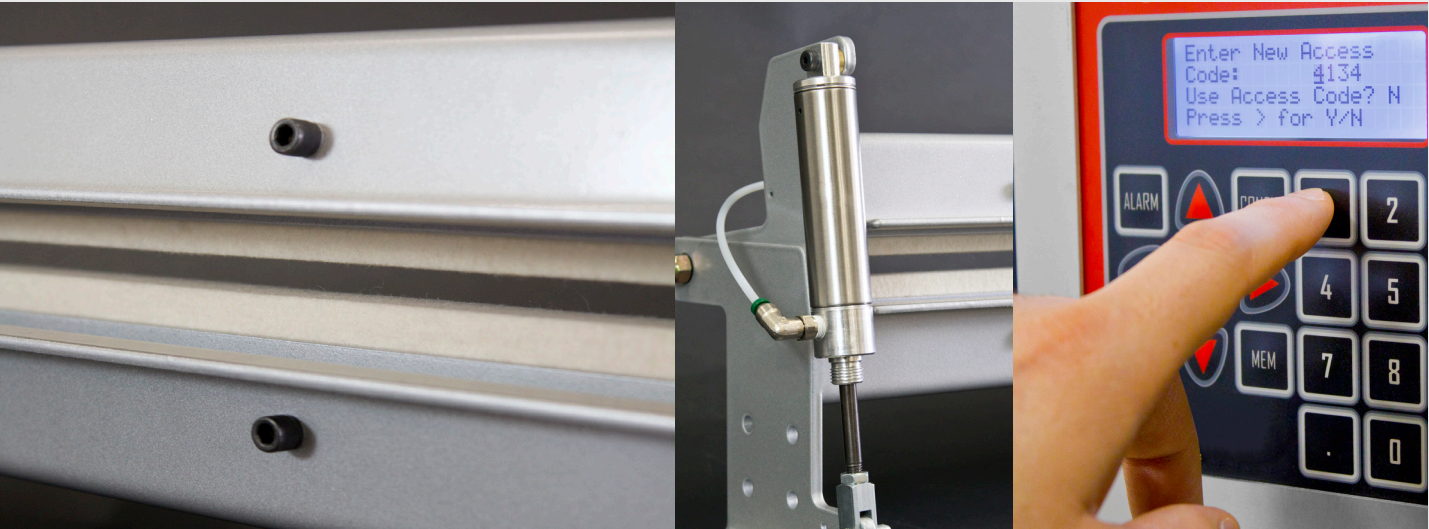
\*Not designed for use with water soluble lubricants

**OAK**  
**E-LUBE**  
system



# OAK E-LUBE SYSTEM

Efficient • Effective • Environmentally Friendly



## FOUR WIDTHS

18" (457 mm)  
27" (686 mm)  
36" (914 mm)  
45" (1,143 mm)

## STOCK THICKNESS

.0036" - .016" (.09 mm - .41 mm)

## Economic Advantages

- Reduction in lubricant use equals lower cost per fin produced.
- Protects valuable tooling by applying an even and consistent oil coating.
- Reversible felt application pads — both sides can be used.
- Stock cleaning wiper system prolongs felt applicator life.

## Technical Advantages

- Adjustable pneumatic cylinders maintain consistent contact with material.
- Multiple mounting options.
- Tough, industrial design withstands daily use.
- Lubricates both sides of the fin stock evenly.

## User Advantages

- Lubricant residue on machine and in machine area greatly reduced.
- Operator accurately controls amount of oil usage depending on unique fin requirements.
- System stores up to 250 easily selectable set-up configurations.
- Coil cleaning requirements reduced.
- Stock cleaning wiper system reduces applicator maintenance.

## Environmental Advantages

- Reduce lubricant usage — apply only what you need.
- Negligible VOC emissions (if non-VOC lubricants are used).
- Improved air quality around fin lines.
- Less clean up and waste disposal.



# OAK PHOENIX PRESSURE EXPANDER

Expansion Reborn



The Phoenix exhibits zero shrinkage throughout the expansion process, resulting in significantly reduced material costs. Additionally, the innovative Phoenix expansion method leaves delicate tube enhancements undamaged, creating more opportunity for experimentation with radical new enhancement designs for improved heat transfer quality.

## PRODUCTION

1m Coil Length: 30 seconds

\*Includes Table Operations,  
Loading, and Unloading

## FOOTPRINT

14' (4.27 m) wide

6.5' (1.98 m) deep

8.5' (2.59 m) tall

\*Excluding compressor and storage tanks

## WEIGHT

≈ 8,000 lb (3,630 kg)

## AIR

1 ft<sup>3</sup>/min at 80-100 psi  
(0.03 m<sup>3</sup>/min at 5.6 bar)

\*Excluding specs for the high pressure air

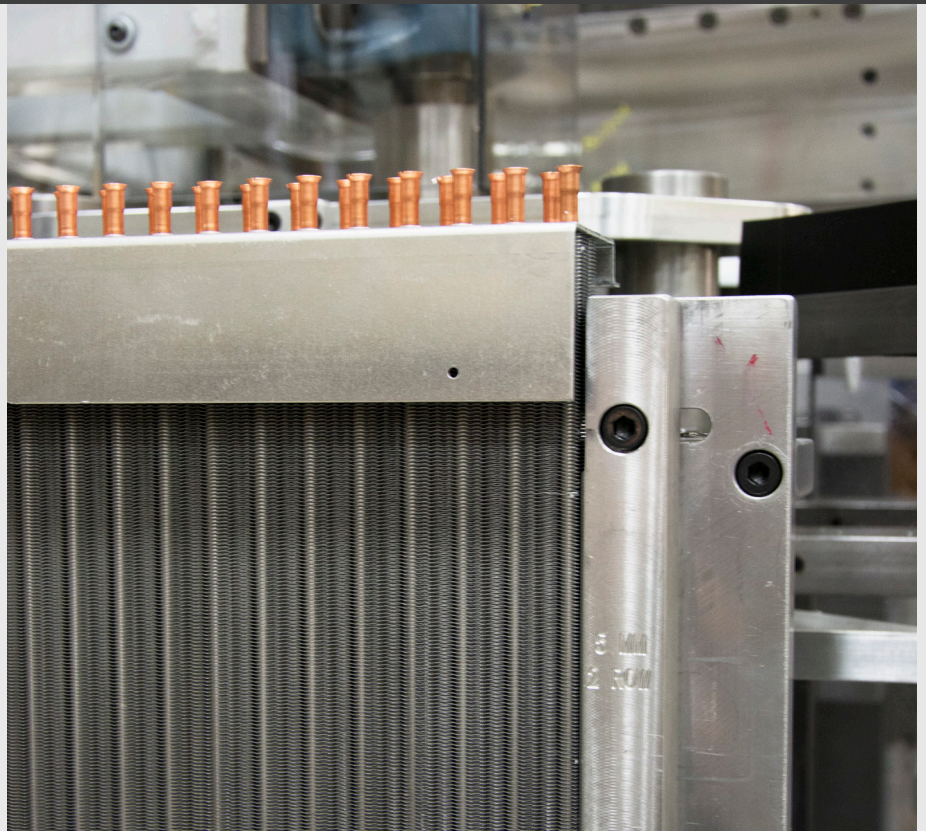
## POWER

8 kW @ .80/.82 PF

24 VDC Controls

\*Compressor power based on coil volume

\*\*Foundation information supplied upon request





# OAK PHOENIX PRESSURE EXPANDER

Expansion Reborn



## COIL PARAMETERS

Coil Type:

Copper tube  
Aluminum fin

Coil Size:

5mm – 10mm  
1–4 rows

Coil Dimensions:

Up to 1.2M coil height  
Up to 0.5M coil width

Expansion Pressure:

Expansion pressure up to  
4,500 PSI (310 Bar)

## Economic Advantages

- Elimination of mechanical bullets and rods.
- Substantial reduction in scrap rate.
- Expansion speed of 30 seconds per coil on a 4-station rotary system.
- Significant reduction in tube material costs due to zero shrink technology.
- Considerable reduction in overall machine floor space and overhead space.
- Identification of substandard coils earlier in the production process, saves downstream material and labor costs.

## Technical Advantages

- Substandard tube detection during expansion process.
- Pneumatic expansion reduces compression forces on coil.
- Innovative bell and flare reduces downstream production challenges with solutions for hairpin peg-leg.
- Leaves flare region un-workhardened for optimal flare.
- Improved flare diameter control.
- Zero deformation of inner-tube enhancements.

## User Advantages

- Ergonomic load and unload station, reduces strain on employees.
- Light curtains for safety allow for optimal efficiency, movement and protection.
- Touchscreen setup allows for rapid expansion diameter adjustments.
- Tooling changeover pulley system makes for fast tooling changeover.
- Operator touch screen controls can be configured for different languages.



# OAK VERTICAL EXPANDER

Consistent and Accurate High Speed Production

## OAK VERTICAL EXPANDER

The OAK line of tube expanders feature machines dedicated to dependably expand heat exchange coils with little damage. Accuracy and precision during tube entry and exit ensure that tubes are expanded uniformly, and fins remain unharmed. Higher production rates are made possible by the short cycle time. The coil lift and eject systems assist in operator safety and ergonomics.

### PRODUCTION

36" (914 mm) Coil Length: 15 seconds  
120" (3 m) Coil Length: 35 seconds

\*Excludes Lift/Table Operations or Loading/Unloading

### FOOTPRINT

8' (2.43 m) to 10' (3 m) wide  
8' (2.43 m) to 22' (6.7 m) deep  
Up to 38' (11.5 m) tall

### WEIGHT

Up to  $\approx$  40 tons ( $\approx$  40,000 kg)

### MATERIAL

.157" (5 mm) to 1" (25 mm) OD  
Straight or Hairpin  
Cu, Al, SS, Steel, CuNi

### AIR

8 ft<sup>3</sup>/min at 80 –100 psi  
(0.23 m<sup>3</sup>/min at 5.6 bar)

### POWER

Requirements for 60 HP Expander  
55 kW @ .80/.82 PF  
24 VDC Controls

\*\*Foundation information supplied upon request





# OAK VERTICAL EXPANDER

Consistent and Accurate High Speed Production



## MECHANICAL EXPANDERS

The vertical mechanical expander is designed specifically for the production of high-quality heat exchanger coils.

The short cycle time allows for both mass production environments and flexible, short run situations.

A standard expander package may include the following:

- Compact Design
- Standard Lift with Fixed Enclosures
- Self-Storing Backplates
- Rod Short-Out System
- Final Expander Support Mechanism
- Coil Eject
- Hydraulic Cooling System (Oil to Air)

## Economic Advantages

- Expansion speeds over 50 fpm, means a 36" (914 mm) coil can be expanded in 15 seconds or 120" (3 m) coil in 35 seconds.
- All tubes can be expanded in a single cycle.
- Customized options for short- or long-run production environments.

## Technical Advantages

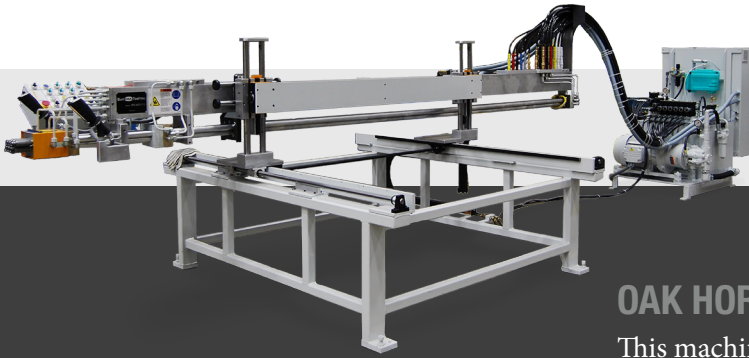
- Structure is designed for a specific task: accuracy and longevity.
- 5 mm to 1" (25.4 mm) diameter tubing, coil widths up to 60" (1,524 mm) standard or 72" (1,828 mm) special.
- Rod short-out system prevents damage before it occurs by detecting expander rod buckling, saving perishable tooling scrap and coils.
- Coil length is repeatable to 1/16" (1.5 mm).
- Many options to enhance production rate & operator ergonomics: coil handling, coil movement and coil containment during expansion.
- Auto-rod option reduces set-up time.

## User Advantages

- Touch screen auto setup of coil height control ensures consistent, repeatable, part-specific setups vs. operator-based setups.
- Touch screen based auto rod pattern reduces changeover time.
- Coil eject system pushes coil out after expansion.
- Operator touch screen controls can be configured for different languages.

# OAK HORIZONTAL EXPANDER

Flexible Expansion at a Modest Price



## OAK HORIZONTAL EXPANDER

This machine uses small bore hydraulic cylinders to expand heat exchange coils with little damage. Tension expanding either straight lengths or both legs of hairpin tubes provides uniform results with no fin damage.

These machines are versatile and can be set up for different coil configurations in just a few minutes. They are also capable of providing high expansion forces for expanding stainless steel and other exotic tubing materials.

### PRODUCTION

70' (21 m) / min.

(single hairpin running light wall copper)

Additional cylinders will reduce the speed

### FOOTPRINT

Support Table:

≈ 78" (1.98 m) wide x 66" (1.7 m) long

Max coil length:

20' (6 m) long

### WEIGHT

≈ 3,300 lbs (1,500 kg)

### AIR

8 ft<sup>3</sup>/min at 80 psi

(0.23 m<sup>3</sup>/min at 5.6 bar)

### POWER

Requirements for 3-4 tube HPE

Average 13 kW @ .80/.82 PF

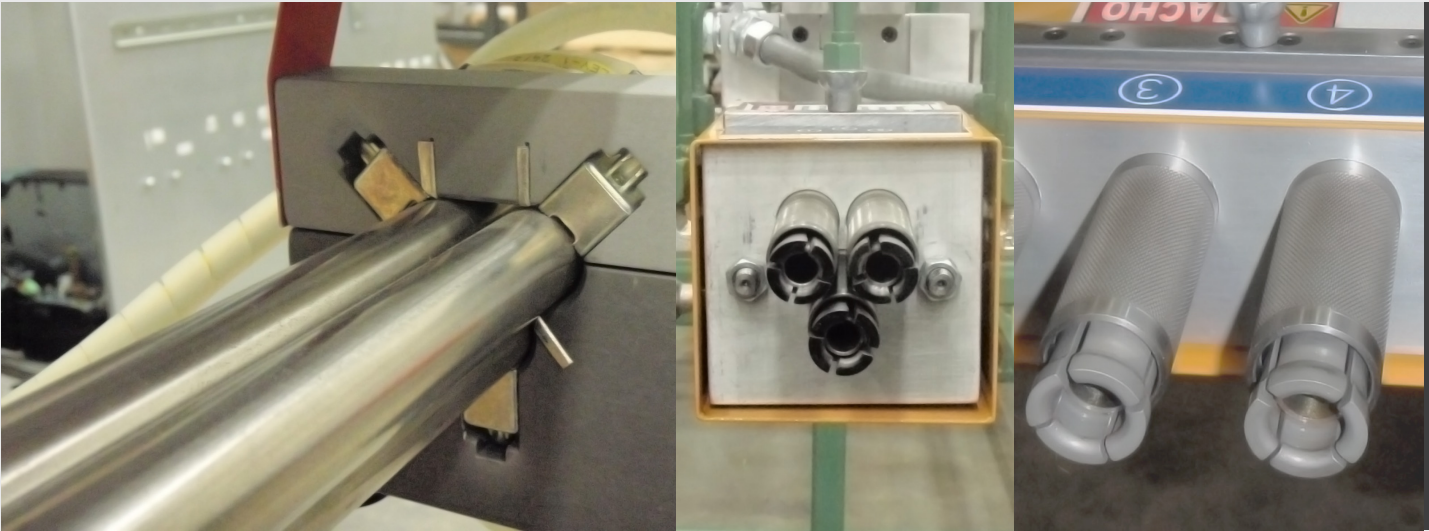
24 VDC Controls





# OAK HORIZONTAL EXPANDER

Flexible Expansion at a Modest Price



## PATTERNS

16 mm or  $\frac{5}{8}$ " minimum distance  
between tubes

## EXPANSION

From 1 to 7 cylinders

## TUBE SIZES

8 mm (.312") to  
25.4 mm (1")

## TUBE MATERIALS

Copper  
Aluminum  
Stainless Steel  
Cupronickel

## Economic Advantages

- Less expensive than vertical expanders.
- Minimal setup time.
- Fast expansion speeds of 70'/min (21 m/min).

## Technical Advantages

- No trimming or end-forming of tube after expansion due to hydraulic collet actuation.
- Use for long tubes up to 20' (6 m) vs. 12' (3.65 m) max for vertical expanders.
- Capable of expanding a wide variety of materials including stainless steel and cupronickel.

## User Advantages

- Ideal for diagonal hairpins; no need to rotate machine to align with tubes.
- Simpler to operate than competitive horizontal expanders due to support table, automatic lubrication and less setup time.



# OAK COIL FORM

## Vertical Arbor Coil Forming

### OAK COIL FORM MACHINE

OAK coil form machines produce high-quality distortion free bends in coils. Recent innovations provide the ability to make bends that were previously impossible when using very low-strength, enhanced fin designs. These machines will form single row coils or multiple single-row coils joined at one end.

The vertical arbor coil form machine incorporates a single, vertically oriented bend arbor that produces one, two, or three 90° bends, which create L-, U-, or box-shaped coils. The cycle time required to produce a single bend - after the coil has been loaded and positioned - is approximately 10 seconds. The vertical arbor technique leaves the mechanical bond between the fin and tube undisturbed, ensuring maximum heat transfer.

### PRODUCTION

1 minute for a single row 3 bend coil  
Includes time required for loading,  
machine processing and unloading.

### FOOTPRINT

≈ 216" (5.5 m) long  
≈ 135" (3.5 m) wide  
≈ 95" (2.4 m) tall

### WEIGHT

≈ 6,000 lbs (2,722 kg)

### POWER

No hydraulics  
No water hookups  
1 CFM @ 80-100 psi air requirement

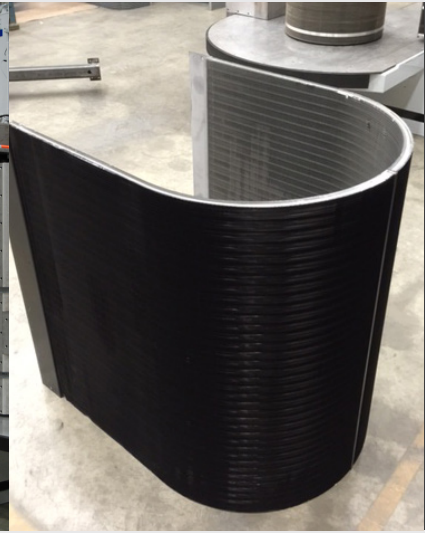
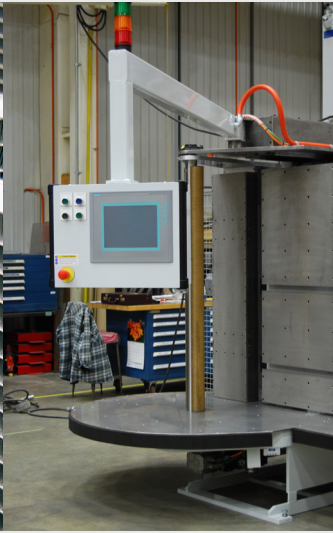
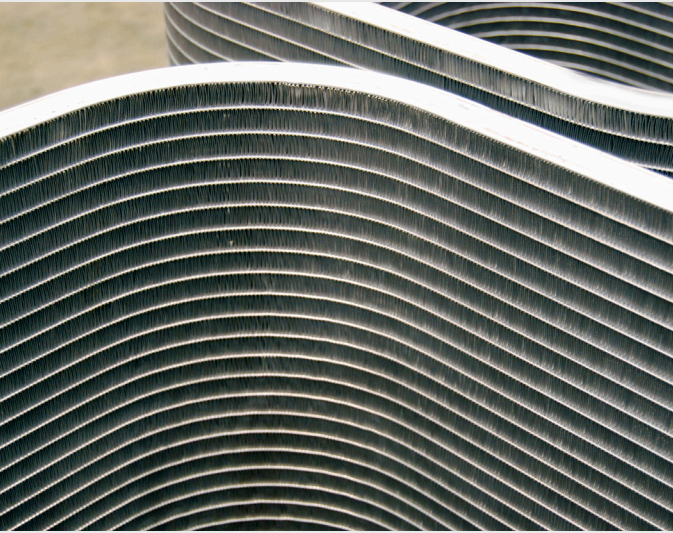
\*Special voltage Transformer Option Available

15 kW @ .80/.82 PF  
24 VDC Controls

\*\*Foundation information supplied upon request







## COIL TYPES

Round Tube Plate Fin (RTPF) Single  
1+1 Row Coil  
1+1+1 Row Coil  
Micro Channel Coil (MCHX)

## CAPACITY

Up to 60" (1.5 m) wide  
118" (3 m) long

## CAPABILITY

Electrically actuated  
Larger capacity  
0° – 90° bend angles standard  
> 90° special  
Makes multiple bends in the coil  
Programmable set up

## Economic Advantages

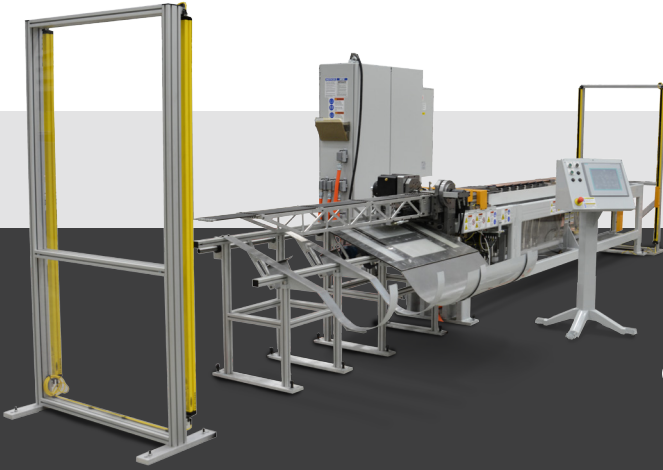
- The M14 is all electric, lowering energy consumption and providing greater precision than hydraulic machines.
- Electric drive requires less maintenance than hydraulic machines.
- RFID prevents scrapping expensive coils by matching part data to the arbor cover, which avoids forming the wrong radius.
- The cycle time is about 10 seconds per bend.

## Technical Advantages

- Forms round and flat-tube coils up to 60" wide and 3 meters long.
- Soft surface arbors enable tighter bends without fin damage.
- Forms bends up to a total of 200°.
- Forms radii as small as 2¼" (57 mm) and as large as 18" (457 mm).
- Forms up to three 90° bends or more if bends are less than 90°.

## User Advantages

- Single operator can load flat coil on table and activate the "Cycle Start" button: machine will automatically position coil(s) for each bend, perform the operation, and present the finished coil at completion.
- Touch screen controls feature part recipes.
- Optional bar code scanner prevents forming wrong pieces of stock.
- Optional coil loading table allows machine to cycle while operator loads next coil.
- Ability to offload coils onto a table or conveyor system.
- Operator touch screen controls can be configured for different languages.



# OAK TRIUMPH HAIRPIN BENDER

High Quality and Consistent Hairpins

# TRIUMPH

Speed, accuracy and quality are not just words anymore – they define the OAK Triumph electric hairpin bender. Burr OAK Tool's revolutionary bender is up to 70% more productive, has a smaller factory footprint, boasts quicker tooling changes, and produces straighter legs and more consistent leg lengths than any hairpin bender on the market.

## PRODUCTION

8 tubes/cycle for 10 mm and smaller

Short Version: 8.4 sec for 1 m length

Long Version: 19 sec for 3 m length

## FOOTPRINT

185¼" (4.7 m) long

44½" (1.1 m) high

33" (0.84 m) wide

## WEIGHT

≈ 5,000 lbs

(2,269 kg)

## AIR

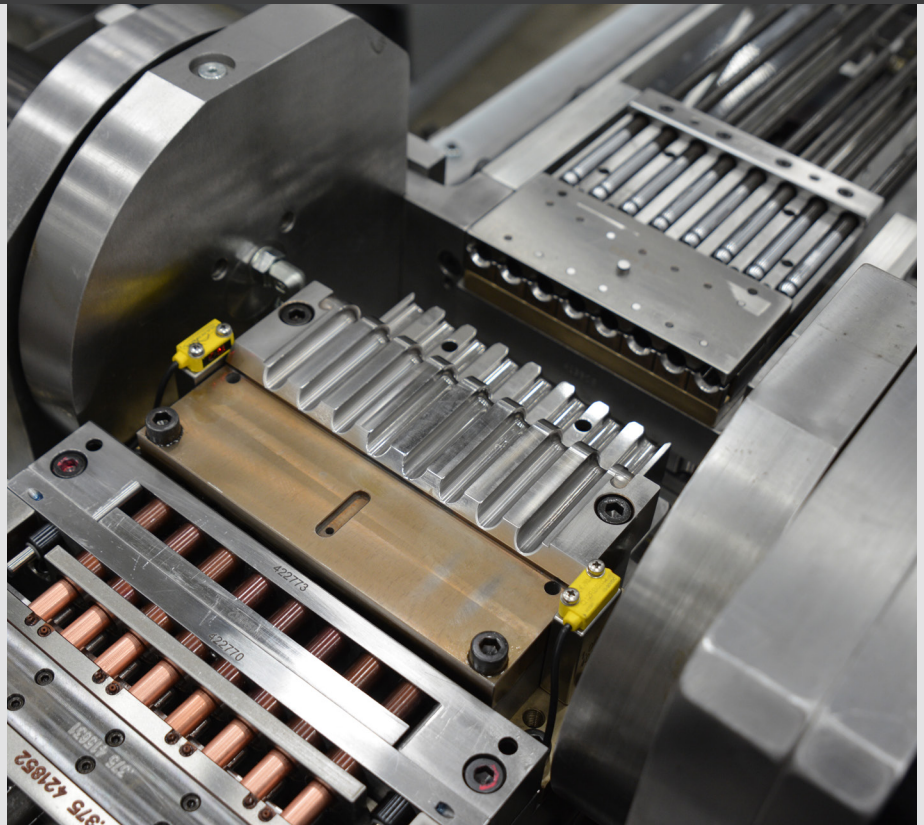
5 ft<sup>3</sup>/min at 80 psi  
(0.14 m<sup>3</sup>/min at 5.5 bar)

## POWER

28 kW @ .80/.82 PF

24 VDC Controls

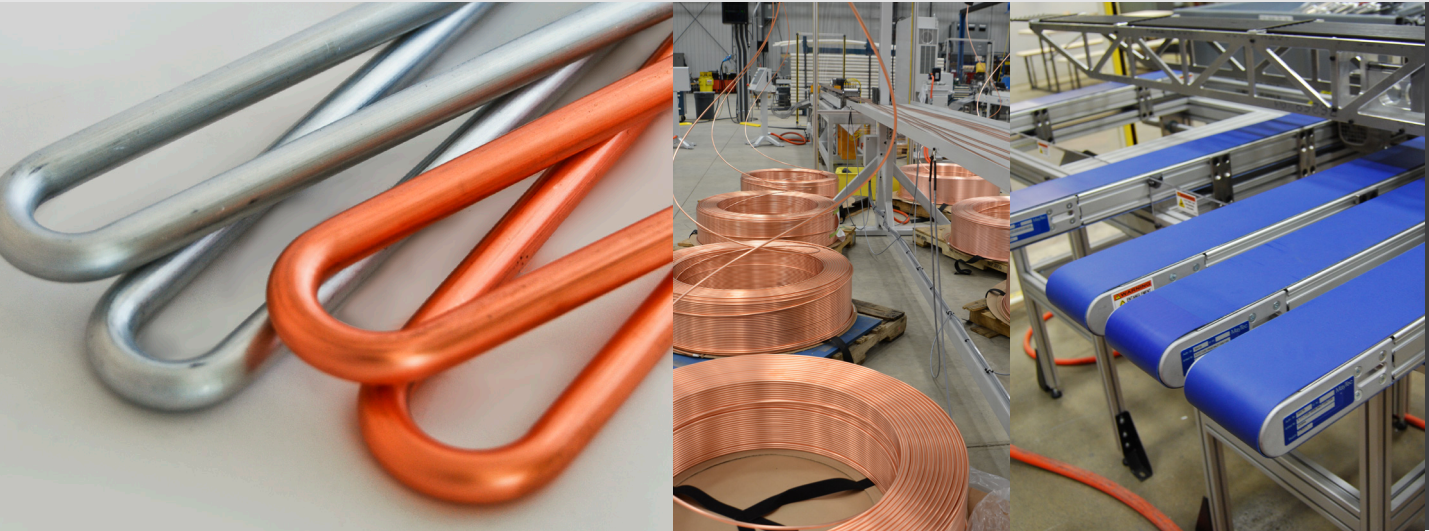
\*\*Foundation information supplied upon request





# OAK TRIUMPH HAIRPIN BENDER

High Quality and Consistent Hairpins



## SIZE

Tube diameter 13 mm or smaller

Short Version:

For hairpins up to 2 m long

Long Version:

For hairpins up to 4 m long

## MATERIAL

Copper

Aluminum

## Economic Advantages

- Less floor space.
- Higher productivity with more output per shift.
- Lower scrap rate aids in material savings.
- Lower maintenance costs.
- Lower cost per hairpin.

## Technical Advantages

- Stretch straightening eliminates rollers and straightens in all planes.
- Innovative cutter head design for superior cut quality.
- Independent hydraulic clamping greatly reduces clamp marks.
- Electric components reduce hydraulic requirements.
- Process control delivers consistent and accurate leg lengths.

## User Advantages

- Touch screen interface improves set-up time.
- Length changes made on touch screen. No more mechanical adjustments.
- Reduced tooling changeover time.
- Operator touch screen controls can be configured for different languages.



# OAK TUBE CUTOFF

## CNC Straight Tube Cutoff (STCO)

### OAK STRAIGHT TUBE CUTOFF

The CNC programmable straight tube cutoff line from Burr OAK Tool is the most flexible straight tube production system ever developed for the tubing industry. Feed length, speed, and batch sizes are all accurately controlled through the touch screen interface, maximizing the productivity of processes and personnel.

This hitch feed design incorporates a belt driven linear actuator that positions an air operated clamp to allow a maximum of 36" (914.4 mm) of stroke feed. The control of many aspects of the hitch feed can be determined by the operator at the touch screen interface. These include part length, number of parts required, and the actual feed speed.

### PRODUCTION

6" (152.4 mm) long: 35 pcs/min  
 18" (457.2 mm) long: 30 pcs/min  
 36" (914.4 mm) long: 26 pcs/min

### FOOTPRINT

M5  
 ≈ 186" long x 40" wide x 72" tall  
 (4.72 m x 1.0 m x 1.82 m)  
 ≈ 4,108 lbs / 1,863 kg

M6  
 ≈ 220" long x 60" wide x 72" tall  
 (5.58 m x 1.5 m x 1.82 m)  
 ≈ 4,410 lbs / 2,000 kg

### AIR

25 ft<sup>3</sup>/min at 80 psi  
 (.708 m<sup>3</sup>/min at 5.5 bar)  
 Constant Volume Air

### POWER

29 – 38 kW @ .80/.82 PF  
 24 VDC Controls

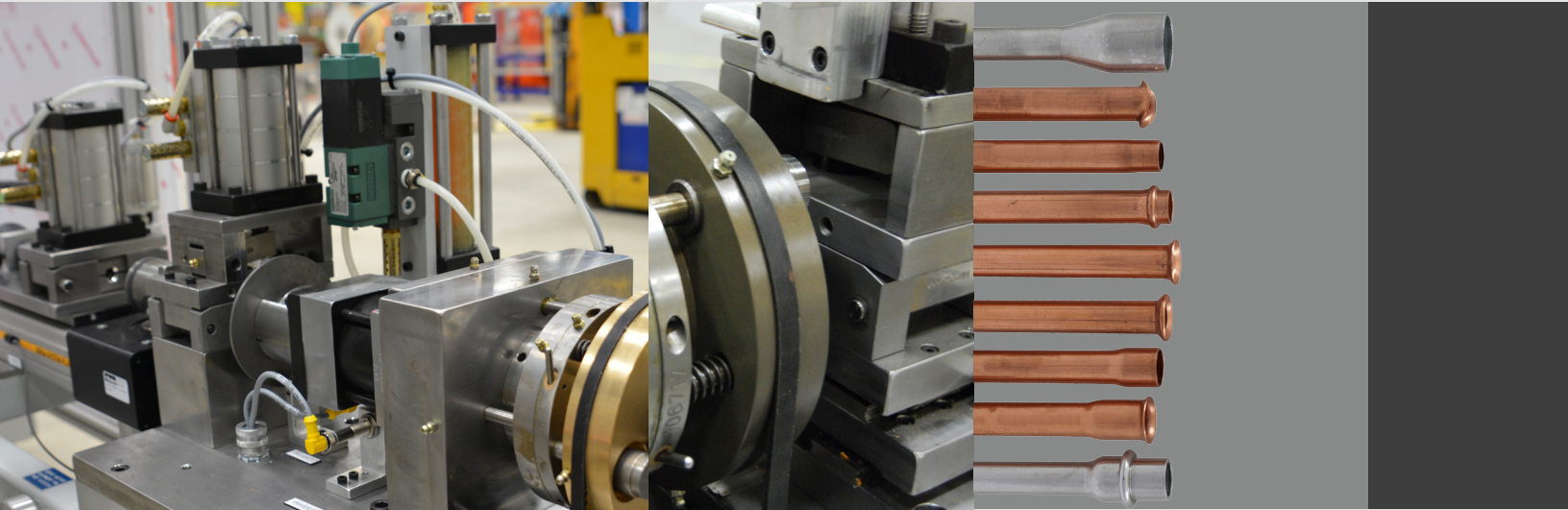
\*\*Foundation information supplied upon request





# OAK TUBE CUTOFF

## CNC Straight Tube Cutoff (STCO)



The operator can enter up to five different lengths and the machine automatically repositions itself each time the correct batch number is achieved, thus reducing set-up time.

We offer all cutoff machines in single or double configurations and with end-forming capabilities.

### MATERIAL SIZE

M5:

3/16" (4.75 mm)\* – 1 1/8" (28.57 mm) OD  
.010" (.25 mm) - .060" (1.52 mm) wall thickness

M6:

3/16" (4.75 mm) – 1 3/4" (44.45 mm) OD  
.010" (.25 mm) - .125" (3.18 mm) wall thickness

### MATERIAL TYPE

Copper  
Aluminum  
Brass  
Steel  
Stainless Steel  
Polypro Coated

### Economic Advantages

- 10 minute tooling changeover.
- CNC auto setup end forming means consistent end-forms with faster setup time.

### Technical Advantages

- Sizes, cuts, straightens and end-forms in a single operation.
- Up to 36" (914.4 mm) material fed in a single stroke.
- Part lengths greater than 36" produced with multiple feed strokes.
- Minimum part length of .750".
- Electric Servo motor; hitch feed instead of air.
- Magnetic cutter carrier enhances cutter blade performance.
- Chipless cut.

### User Advantages

- Touch screen controls for feed length, feed speed and batch size.
- Tooling changes typically do not require tools.
- Clear guarding provides an unobstructed view of the machine in operation while protecting operator.
- Guarding is mechanically locked during machine operation to ensure operator safety.
- Operator touch screen controls can be configured for different languages.

\*Please contact your Sales Engineer for information on smaller tube diameters.



## OAK RETURN ELBOW CROSSOVER BENDER (RECB)

This machine is designed with versatility in mind. This hydraulic powered machine can produce return bends, crossover bends, elbow bends and short straight tubes with a simple, quick tooling change and setup.



### PRODUCTION

Cycle Speeds:

- Crossover: 8 cyc/min
- Elbow: 10 cyc/min
- Return Bend: 11 cyc/min
- Straight: 22 cyc/min

Bends per Cycle:

- 1/4" – 3/8": 3 b/c
- 1/2" – 3/4": 2 b/c
- 7/8" – 1 1/4": 1 b/c

### MATERIAL

- 1/4" dia – 1 1/4" dia
- Straight lengths or coil tubing
- Copper, Aluminum

### FOOTPRINT

- ≈ 12.14' x 6.89' x 6.89' (3.7 m x 2.1 m x 2.1 m)
- ≈ 8,000 lbs (3,629 kg)

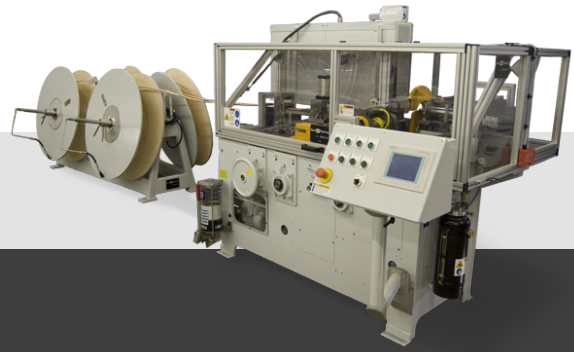
### AIR

- 6 ft<sup>3</sup>/min at 80 psi
- (0.2 m<sup>3</sup>/min at 5.5 bar)

### POWER

- 12 kW @ .80/.82 PF
- 24 VDC Controls

\*\*Foundation information supplied upon request



## OAK MECHANICAL RETURN BENDER (MRB)

This machine is specifically designed to produce return bends at high production speeds. This machine automatically feeds, bends, and cuts off return bends from the electric motor driven, with cam operated mechanisms. The Mechanical Return Bender has no hydraulics and requires only electrical and pneumatic connections.



### PRODUCTION

Up to 18 cycles per minute

Bends per Cycle:

- 5 mm: 4 – 6 b/c
- 6 mm – 1/4": 4 – 5 b/c
- 7 mm – 3/8": 4 – 5 b/c
- 12 mm – 1/2": 3 – 4 b/c
- 5/8": 3 b/c
- 3/4": 2 b/c

### MATERIAL

- 5mm dia – 3/4" dia
- Copper or Aluminum
- Straight lengths or coil tubing

### FOOTPRINT

- ≈ 6.08' x 4.92' x 5.91' (4.9 m x 1.5 m x 1.8 m)
- ≈ 10,000 lbs (4,536 kg)

### AIR

- 10 ft<sup>3</sup>/min at 80 psi
- (0.3 m<sup>3</sup>/min at 5.5 bar)

### POWER

- 9 kW @ .80/.82 PF
- 24 VDC Controls

\*\*Foundation information supplied upon request



# OAK SMALL BENDERS

Tube Bending Machines



OAK small bending machines turn out multiple bend angles easily and dependably. The cuts are straight and bend centers are accurate, protecting your investment in the quality of your final product.

## Economic Advantages

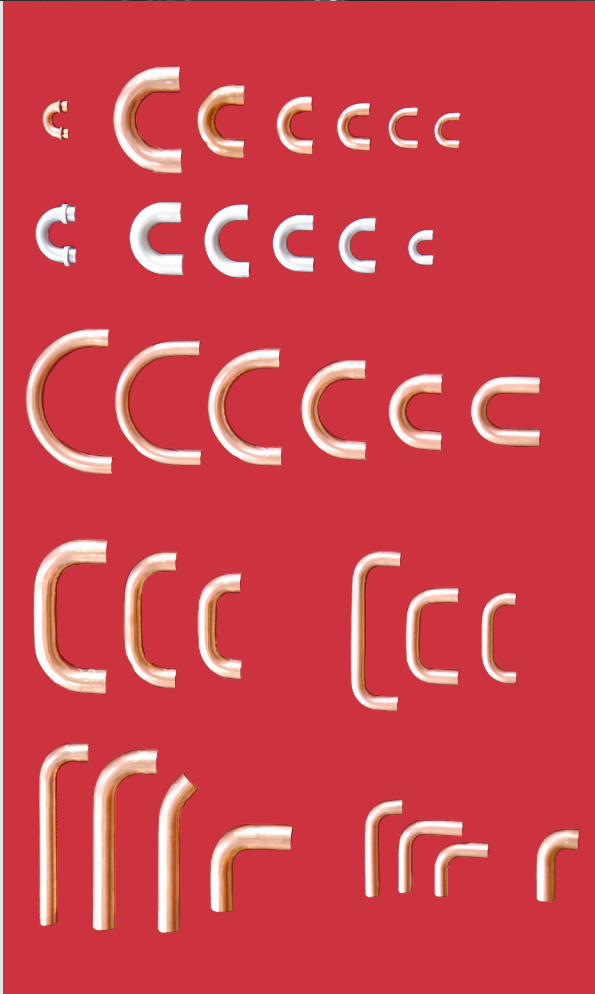
- Point-of-use production of return bends enhances lean manufacturing processes.
- In-house production eliminates the shipping and handling costs of out-sourced material.

## Technical Advantages

- Can be configured to produce bends from a variety of materials.
- Various uncoiler designs allow the use of the most cost effective tubing coil configuration.

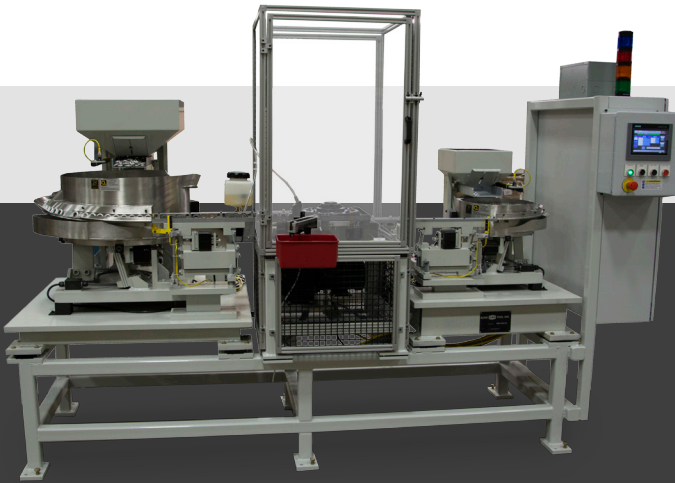
## User Advantages

- Human Machine Interface (HMI) facilitates easy access to various operator controls and eliminates the need for manually adjusted hard stops.
- Guard design allows an unobstructed view of the tooling and working parts while ensuring the safety of the operator.
- Guarding is electronically locked during machine operation to ensure operator safety.
- Operator touch screen controls can be configured for different languages.



# OAK SATURN SIZE AND RING MACHINE

Tandem Load, Size, Ring and Eject



This newly designed machine properly sizes return bend legs and assembles braze rings onto each leg. Ring placement and sizing are both accurate and consistent, requiring little operator interface. This machine has rotating stations that work in tandem to load, size, ring, and eject. Each function is performed during each cycle of the machine.

## PRODUCTION

120 pcs/min

## FOOTPRINT

≈ 48" wide x 114" long x 84" tall  
(122 cm x 290 cm x 213 cm)  
≈ 3,000 lbs / 1,350 kg

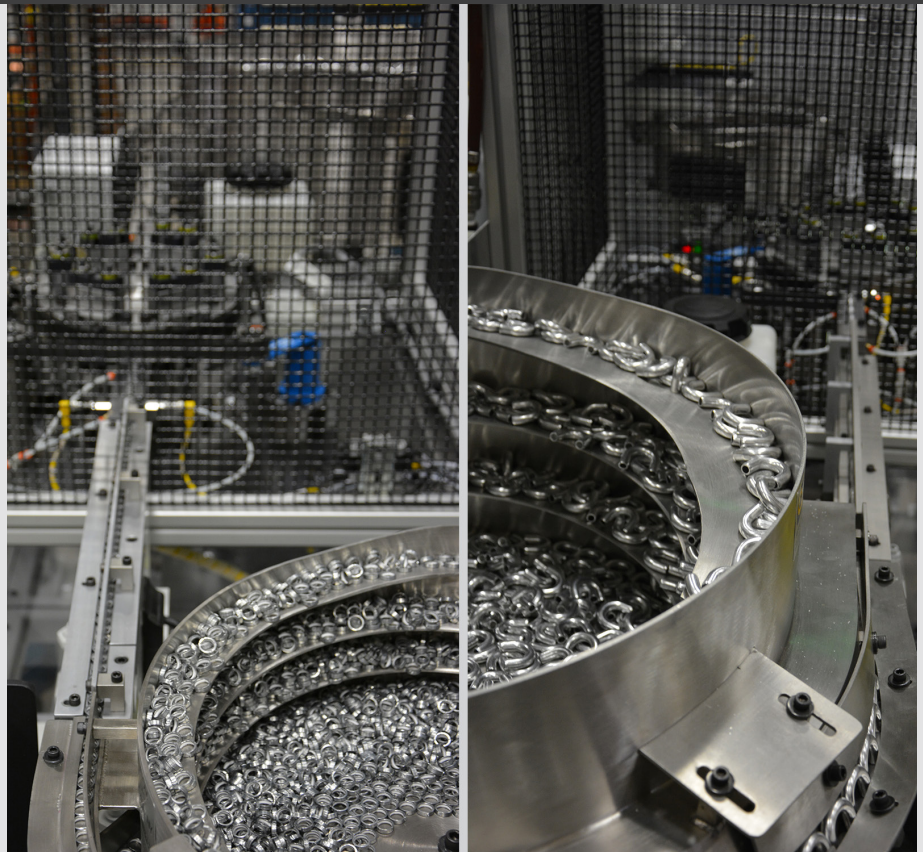
## AIR

2 SCFM at 80 psi  
(0.057 m<sup>3</sup>/min at 5.5 bar)

## POWER

5 kW @ .80/.82 PF  
24 VDC Controls

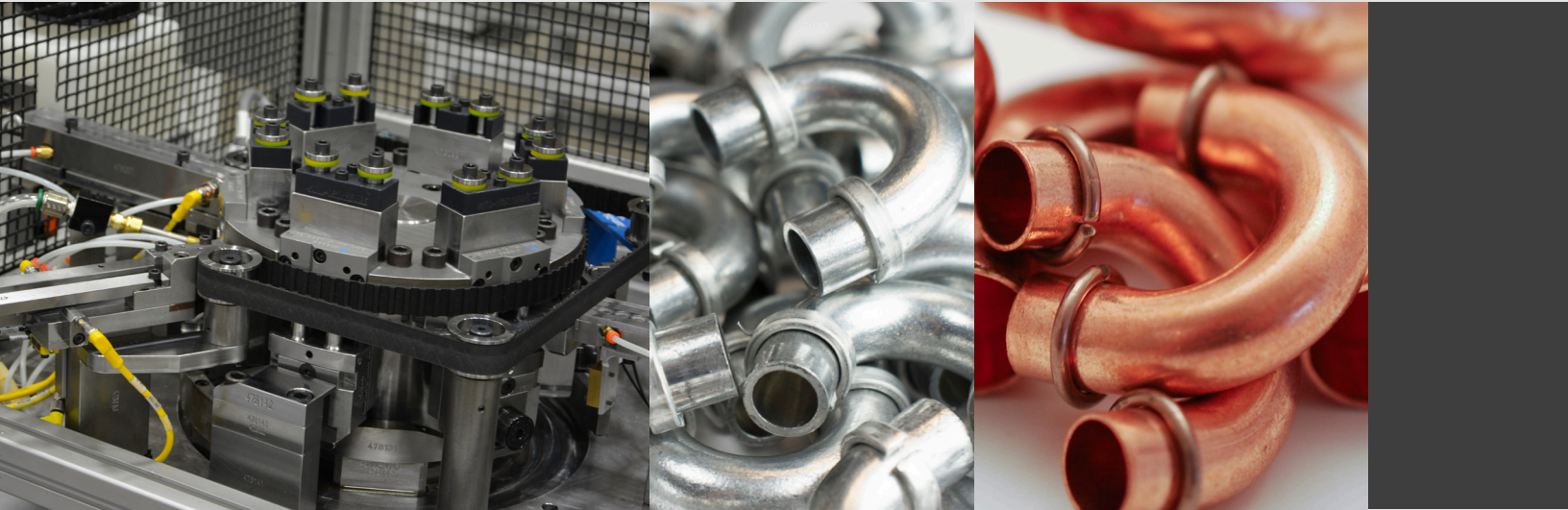
\*\*Foundation information supplied upon request





# OAK SATURN SIZE AND RING MACHINE

Tandem Load, Size, Ring and Eject



## MATERIAL SIZE

Tube diameter 10 mm or smaller

## MATERIAL TYPE

Copper

Aluminum

## BEND TYPE

Return Bends

## BEND SIZE

5/8" (16 mm) – 1 1/2" (38.1 mm)

## BEND LEG LENGTH

3/16" (4.75 mm) – 1/2" (12.7 mm)

## Economic Advantages

- One machine does both sizing and addition of rings.
- Higher productivity with more output per shift.

## Technical Advantages

- Fast production – performs up to 120 parts per minute.
- Able to size and ring copper or aluminum bends.
- Less flux loss with vibratory system vs. rotary drum basket.
- Ring detection with auto eject of return bends with missing rings.
- Rings are pushed on squarely – higher retention of aluminum rings.
- Bend detection before ringing - results in less jams, downtime, & scrap.

## User Advantages

- Bend center tooling changeover in under 30 minutes.
- Intelligent loading sensors will pause cycle if lacking material.
- Machine will count parts and display scrap rate on HMI.
- Consistent part orientation and uniform track unloading to ease downstream processes.
- Guarding provides a clear view of the machine in operation while protecting users.
- Guarding is interlocked during machine operation to ensure operator safety.
- Operator touch screen controls can be configured for different languages.

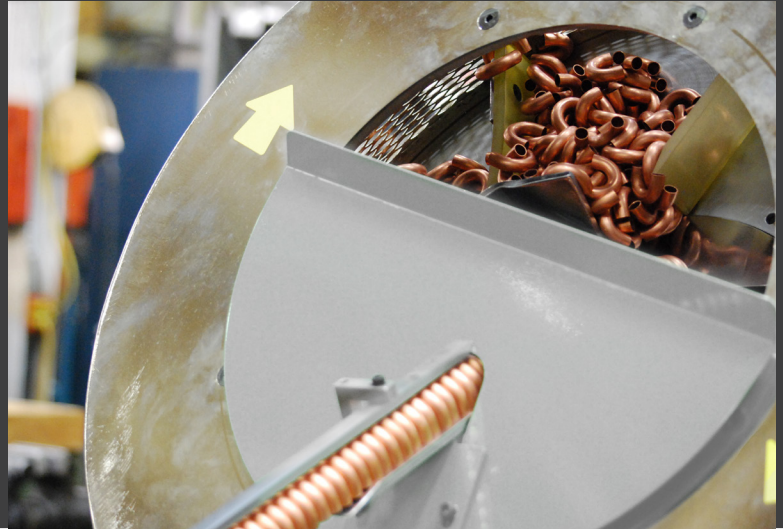
# OAK SIZE MACHINE

Size Return Bend Legs



## OAK SIZE MACHINE (SM)

This machine is designed to properly size return bend leg ends. A hydraulically powered mechanism provides the necessary force for the operation which can include expansion or reduction of the leg ends. Return bends are automatically loaded into the work area from a rotary hopper to allow continuous operation.



## PRODUCTION

60 cycles per minute max.

60 1/4" – 3/8"

50 1/2"

40 5/8"

## MATERIAL

1/4" dia – 5/8" dia

Copper or Aluminum

Return Bends or Crossover Bends

## FOOTPRINT

≈ 3.94' x 4.92' x 7.88'

≈ (1.2 m x 1.5 m x 2.4 m)

≈ 2,000 lbs (907 kg)

## AIR

2 ft<sup>3</sup>/min at 80 psi

(0.3 m<sup>3</sup>/min at 5.5 bar)

## POWER

8 kW @ .80/.82 PF

24 VDC Controls

\*\*Foundation information supplied upon request

## Economic Advantages

- Less expensive than a combination size and ring machine – perfect for applications where a ring is unnecessary.
- Adjustments are mechanical to avoid the unnecessary expense of additional technology.

## Technical Advantages

- SM is able to size return bends and crossovers, as well as heavy wall tubing.
- Size Machine can reduce or expand bend legs.
- Hydraulic powered when more force is required.

## User Advantages

- Gravity-fed from rotary hoppers for easy delivery of return bends into the Size Machine.



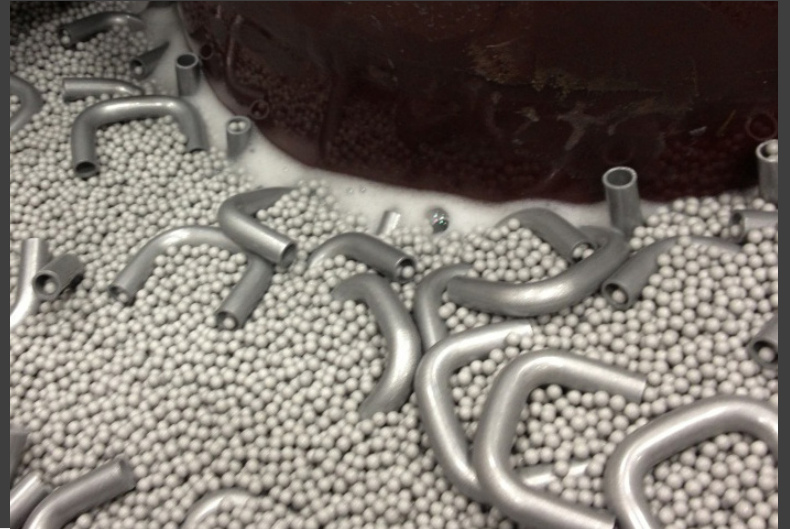
# OAK RETURN BEND CLEANING UNIT

Clean Elbows, Straight Cuts, Return Bends or Crossovers



## OAK RETURN BEND CLEANING UNIT (RBCU)

The M3 OAK Return Bend Cleaning Unit (RBCU) is an environmentally friendly and versatile machine. It cleans multiple bend sizes, shapes, and materials requiring little operator supervision. The final product is delivered clean, dry, and ready to move into the next production process.



### PRODUCTION

10 – 15 minutes cleaning time

### MATERIAL

¼" dia – 1¼" dia

Copper or Aluminum

Return Bends, Crossover Bends,  
Straight Lengths and Elbows

### FOOTPRINT

≈ 4.27' x 8.20' x 5.91'

≈ (1.3 m x 2.5 m x 1.8 m)

≈ 5,952 lbs (2,700 kg)

### AIR

10 ft<sup>3</sup>/min at 80 psi

(0.3 m<sup>3</sup>/min at 5.5 bar)

### WATER

10 gal/hr at 30 psi (44 ltr/hr)

Gravity feed to sewer

### POWER

10 kW @ .80/.82 PF

24 VDC Controls

### Economic Advantages

- One machine cleans multiple parts and materials
- Requires very little operator supervision – freeing operators to perform other tasks.

### Technical Advantages

- Capable of cleaning elbows, straights, return bends or crossovers of most sizes.
- Can be hooked up to any bender line.

### User Advantages

- Creates ready to go parts — cleans, degreases, deburrs and dries.
- Touch screen allows easy access to machine controls.
- Improved ergonomic height compared to previous cleaning machines.

\*\*Foundation information supplied upon request

## **OAK** Press Solutions

504 Wade Street  
Sturgis, Michigan  
USA 49091  
Ph: +1 (269) 651-8513  
www.oakpresses.com  
sales@oakpresses.com

## **OAK** Eurasia

NH 2.3.2 Adelardis  
Tylova 57/1, Plzeň  
CZECH REPUBLIC 316 00  
Ph: +420 378 133 380  
www.oakeurasia.com  
sales@oakeurasia.com

## **OAK** India

C388 Second Floor  
Sushant Lok – 1, Gurgaon  
INDIA 122009  
Ph: +91 124 407 8933  
www.oakindia.in  
anandsharma@oakindia.in

### **BRAZIL**

Shinwa do Brasil Ltda

#### **Mr. Hitoshi Majima**

Rua João Antunes do Nascimento, 77  
Santa Rosália – Sorocaba  
SP, BRASIL 18095-470  
+55 (15) 3233-3858  
www.shinwa-br.com.br  
contato@shinwa-br.com.br

### **CHINA**

TSD Guangzhou Co., Ltd.

#### **Mr. Darren Dai**

No. 467 Qiaoxing Main Rd.  
Panyu Area, Guangzhou City  
CHINA 511400  
Ph: +86 20 84669756  
www.gztsd.com  
darren@gztsd.com

### **JAPAN**

Shinwa U.S.A. Corp

#### **Mr. Aaron M. Steht**

3233 Mineola Pike  
Erlanger, Kentucky  
USA 41018  
Ph: +1 (859) 746-6700  
www.shinwa-usa.com  
aaron.steht@shinwa-usa.com

### **JAPAN**

Shinwa Co., LTD

#### **Mr. Naoki Fukutani**

2-9-3 Naeshiro, Moriyama-ku,  
Nagoya-shi,  
JAPAN 463-0046  
Ph: +81 52 796 2554  
www.shinwa-jpn.co.jp  
info-obd@shinwa-jpn.co.jp

### **KOREA**

Sewon Trading Co., Inc.

#### **Mr. JaiYoung Choi**

“308” 246 Gwangdeok 4-ro  
Danwon-gu, Ansan-si  
Gyeonggi-do  
KOREA 15464  
Ph: +82 10 8988 9441  
sewon234@naver.com

### **MEXICO**

Linco, SC.

#### **Mr. Enrique Sanchez**

2 Sur 17006  
Col. El Carmen  
Puebla  
MEXICO 72000  
Ph: +52 222 893 8210  
esanchez@linco.com.mx

### **CANADA**

Tubex Technology  
Machinery Inc.

#### **Mr. Michel Kannage**

210A Brunswick, Pointe Claire  
(Montreal), QC,  
CANADA H9R 1A6  
Ph: +1 800 861 8864  
www.tubextechnology.com  
kannagem@tubextechnology.com

### **THAILAND**

ABOS Co., Ltd.

#### **Mr. Arsadon Chayaphum**

16/35 Moo 7 Sol  
Wongvanchadchawan  
Bangkhunthian-Longtalay Road  
Takram, Bangkhunthian, Bangkok  
THAILAND 10150  
Ph: +662 897 2312  
arsadon@abos-thailand.com



405 W South Street,  
Sturgis, MI, USA 49091



+1 (269) 651- 9393



sales@burroak.com



www.burroak.com

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