ISMR SAYS:
"Headquartered in the City of Industry, California, PHI today consists of two manufacturing operations strategically integrated into one facility"

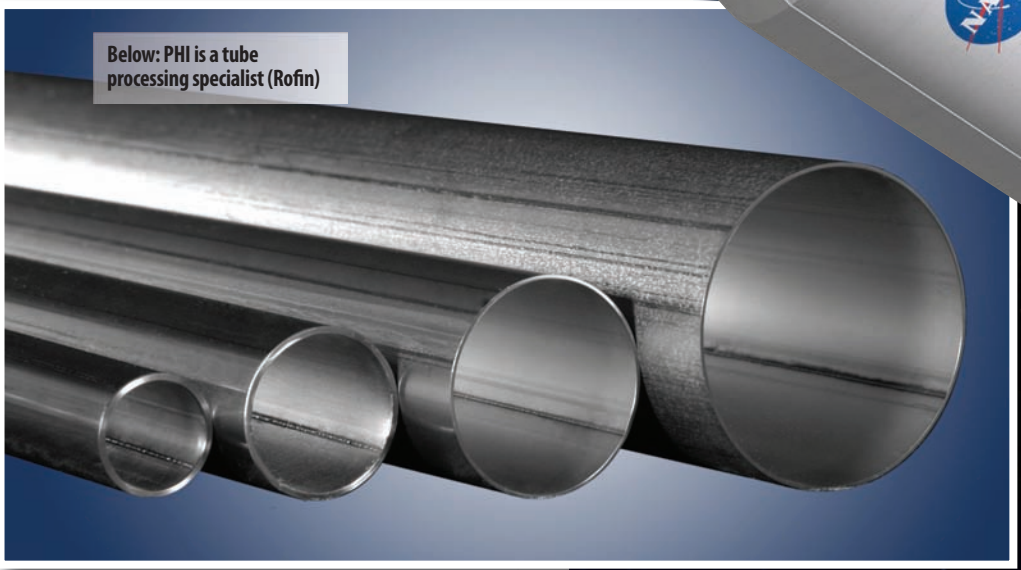
ISMR profiles PHI, a leader in tube bending and end finishing machines, based in the US

A BEND IN TIME

PHI, a leader in tube bending and end finishing machines, is a division of Tulip Corporation and a privately held company. Having purchased Leonard Precision and Conrac Corporation's Machine Tool Division and operated as PHI since 1985, it continues to grow in the US whilst addressing a range of new markets and applications. As a tube fabricating machinery manufacturer, PHI has more than 40 years' experience in the field.

PHI's machine tool products today include tube/pipe benders, end finishing machines, flare-flange equipment and tooling as well as automatic welding systems. Its tube and pipe benders are designed to meet a wide variety of customer requirements, from small production or prototype job shops to high end users.

"2010 sales are much better than our sales in 2009 and we expect that 2011 will, in the same way, be ahead of 2010," Steven Moss, PHI sales manager, told ISMR. "Our customers include governments, militaries, aerospace/aviation companies, metal fabricators and manufacturers plus those in steel construction and new material testing worldwide."



Below: PHI is a tube processing specialist (Rofin)

TRENDS AND APPLICATIONS

Moss has noted several trends in the industries served by PHI.

"I have seen growth in the US for more simple bending of tubes but with newer materials, while end finishing remains the same. This has generated an increase in sales of our manual benders," he told ISMR.

"I have also noticed growth in the Asian markets, a slowdown in Europe and, recently, a slight resurgence in the Middle East," he continued. "Due to the many applications for our machines , we recently added to our inside sales department to cater for growing market needs for our machines."

Headquartered in the City of Industry, California, PHI today consists of two manufacturing operations strategically integrated into one facility. The first operation produces compression presses for applications such as printed circuit board lamination and composite plastic moulding. The second manufacturing operation produces precision, semi-automatic tube and pipe fabricating equipment for bending and end-finishing, including the associated tooling, as well as automatic beam welding systems.

The aerospace/aviation market has been a strong consumer of PHI's tube bending products. Its tube bending and end-finishing machines are used by leading commercial manufacturers of passenger aircraft. For the aviation industry, the primary application of these machines is in the hydraulic systems of various aircraft. Working with titanium, stainless steel and aluminum, PHI benders and end-finishers are used extensively by aerospace manufacturers.

PRODUCTS AND INNOVATIONS

PHI offers a complete family of machines and tooling for applications ranging from 1/8" light wall tubing to 8" pipe. The end finishing machines are used to shape the ends of pipe and tubes including flaring, beading, squaring

"PHI's machine tool products today include tube/pipe benders, end finishing machines, flare-flange equipment and tooling as well as automatic welding systems"

and deburring and 90° cold flanging.

"There is a standard machine in the PHI line for almost any tube or pipe end-finishing requirement— flaring, double flaring, beading, squaring, deburring, or flanging— for applications ranging from 1/8" light-wall tubing to heavy 8" pipe. To increase efficiency, every PHI machine features simplified set-up procedures with minimum time loss in small-lot production change-over.

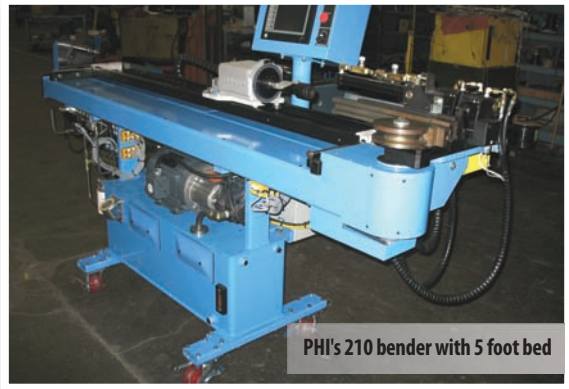
"The PHI designs also enable new operators to run the machines at near top efficiency after a very short training period. All of PHI's production machinery is manufactured on our own premises, assuring users that our rigid quality specifications are met on every item we ship," Steven Moss explained.

Bending machines are available from small bench-top models to larger machines designed for tubes of up to 3" x .188 WT, with bend radii as tight as two times the tube diameter. Controls range from manual to programmable.

A full complement of machines range from manually-operated machines, where precision bending and portability are required, to more sophisticated higher production machines, that require hydraulic bending and programmability for precision forming (providing accurate repeatability from part to part). Pipe flanging machines and automated multi-head welding systems are among the family of specialised products offered by PHI.

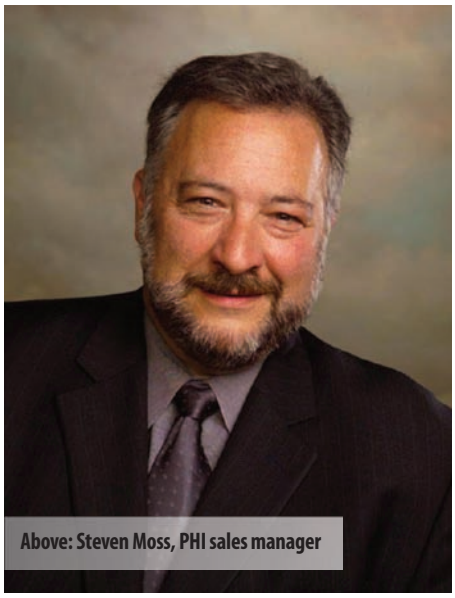
"As manufacturers of production equipment, we have taken special care to design safety and reliability into each machine. Every PHI machine carries a one-year parts and labour warranty from the date of delivery, and a staff of service specialists is available to travel worldwide," Moss told ISMR.

The company originally founded in the early 1940s now also manufactures welders, presses and tooling to go with its portfolio. Steven Moss reports that these systems have been sold to the "Who's Who" in the industry, and that PHI is now poised to take a more aggressive role



PHI's 210 bender with 5 foot bed

Below: The aerospace industry is a strong consumer of PHI's tube bending products.



Above: Steven Moss, PHI sales manager

> **"The PHI beam welder is suitable for the PEB (Pre-Engineered Buildings) industry as it can create a variety of beam shapes"**

Below: PHI's 192 4 x 6 bender

in addressing the market.

"Our customers can now manufacture custom beams continuously with minimum delays for changing beam sizes or shapes," Moss explained. "The PHI Automatic Steel Beam Welder enables higher productivity on both straight and tapered steel beams. It automatically welds both flanges of the beam at once, delivering the penetration needed on up to 1/2" steel web and 1-1/2" flange—all in one operation, one pass and from one side."

The PHI system produces a fillet weld between the web and flange. Welds are uniform and of the quality demanded by construction codes. PHI's seam welder is used to join separate web sections with a 100% welded seam and to fabricate long webs from short sections or to join sections of different thicknesses.

"The PHI beam welder is suitable for the PEB (Pre-Engineered Buildings) industry as it can create a variety of beam shapes. This versatility goes a long way for builders who want to customise their PEB designs. By crafting beams that can be used in pre-engineered buildings, builders can use the PHI beam welder to reduce building costs and decrease the time it takes to complete PEB projects," Moss told ISMR.

PHI's new Flange Tilting Device is used for the manufacture of "H" beams - the flanges are automatically tilted to a vertical position against magnetic rollers prior to assembly with the web at the tacking fixture. Done in the past manually by one or two operators, this can now be done automatically, reducing manpower requirements. This tilting system is intended for use in welding lines without automatic tilting systems provided originally by PHI.

The company's new Beam Turning Device enables users to increase production by rotating the beam and welding on both sides of the beam which is required by some building codes.

"We have made a number of refinements to our product portfolio to answer market demands, such as drop-away clamps to allow the bending of more complicated shapes, and pressure die assists that provide the operator with more precise control over wall thickness issues," Moss told ISMR.

The PHI Adaptive Tooling System can handle a wider range of material diameters on one machine. Conversely, it makes a single item of tooling usable on a number of different PHI bending machines.

PH hydraulic compression presses are standard air actuated presses that incorporate phi's specialized platen designs and advanced Pneumatic/Air Over Oil systems into a precision four-post press, intended for applications requiring accurate control of pressure, temperature and parallelism.

PHI also offers a variety of presses that are suitable for laboratory testing applications. Its material testing presses cater to a variety of industries from biomedical material testing to plastics, composites, rubber, polymers and fatigue testing. **ISMR**

CONTACT

PHI
14955 E. Salt Lake Ave.
City of Industry, California 91746
USA
Tel: +1.626.968.9686 Fax: +1. 626.333.3610
Email : phisales@phi-tulip.com
Website: www.phi-tulip.com