

Model 2C, 2CP, and 2CPV

These models are designed for smaller diameter tubes and pipes.

Model 2C features manual clamping for easy-to-form materials and low production requirements. Model 2CP has air cylinder clamping for higher production rates and more difficult-to-form materials. Both models have two-speed spindles, allowing you to choose the most efficient speed for the function you are performing.

The 2CPV capacities are the same as the 2CP. In addition, the 2CPV has a variable-speed drive (0-2000 RPM) with a 3/4 HP motor and digital RPM readout.

Model 3CPV

The Model 3CPV extends the range of the PHI end-finishing machines to include tubes and pipes with outside diameters up to 3".

As in the case of the other PHI models, flares are formed to standard 37° and 45° angles, meeting MS33584 and SAE specifications. Beads are formed within the tight specifications called for in Military Specification MS33660.

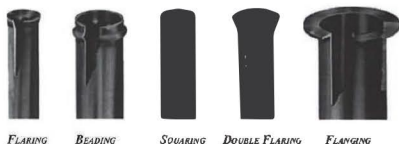
Features of the Model 3CPV include pneumatic clamping, and cabinet stand with tooling shelf. A variable-speed motor allows the operator to select a slower speed for extended blade life when deburring stainless steel.

Model 8CPV

Model 8CPV is the largest in the family of PHI end-finishing machines and can be used to flare, bead, deburr, and square tubes or pipes with outside diameters up to 8 inches.

An air cylinder with heavy-duty linkage holds the tube or pipe firmly in place during each operation, preventing slippage and ensuring that all forming is done within appropriate specifications.

The Model 8CPV also features a variable-speed drive for efficient operation regardless of material or wall thickness. Hard materials such as stainless steel can be deburred at slower speeds, for example, without undue wear of the blades.



Models 2C, 2CP, 2CPV, 3CPV, and 8CPV

form a family of machines for preparing the ends of tube or pipe for joining with other tube or pipe sections, valves, T-joints, or machinery.

The ends can be prepared with a bead or flare, or simply deburred and squared. Each machine is capable of performing all of these functions; a change of tooling is all that is required to switch from one function to another.

Squaring, Deburring, & Flaring

Flared joints form liquid-tight, air-tight connections at the ends of tubing or pipe.

To obtain an effective, long-lasting seal, each end of the tube or pipe must be formed to the exact shape of the matching flare fittings.

Tooling supplied by PHI meets this objective. And in almost every case, the same end-finishing machine can be used to perform the required squaring and deburring of the cut end before the flare is formed.

Typical Applications: Hydraulic systems and fuel lines in the aircraft, automotive, heating, and cooling industries.

Beading

Beading is a versatile end-finishing technique that can be applied to a variety of industrial applications.

In conjunction with an o-ring, for example, beaded joints can be used to interconnect exhaust tubes or low-pressure fuel lines. Beads can also be used to dampen vibration in solid lines or to increase the effectiveness of the seal when a rubber or fabric sleeve is clamped to a metal duct.

Typical Applications: Low-pressure air, exhaust, and liquid systems in the automotive, appliance, and boating fields.

Double flaring

Double-lap flares provide added-strength joints which are more resistant to fatigue and provide a better seal than single-thickness flares.

Double-lap flares formed by PHI machinery and tooling are free of cracks and pitmarks. The joint is also designed so that the inside

surface of the flare has a larger diameter than the inside diameter of the tube or pipe and, therefore, does not interfere with flow characteristics of the system.

Typical Applications: Thin-wall tubing connections that are subject to shock, vibration, or high internal pressures such as automobile brake lines and critical aircraft hydraulic lines.

Flanging

Pipe-flanging machines permit the joining of pipe sections without the need for costly welded flanges and the associated temporary tack welding, slag removal, and X-ray inspection.

A prefabricated slip flange is placed against the assembly on an adjacent pipe section. A disc-shaped rubber seal placed between the two formed flanges prevents any leaks. Problems in lining up bolt holes are eliminated with the use of slip flanges which rotate freely on the pipe. Standard flanges can still be used.

Typical Applications: Chemical plants, petroleum refineries, power plants, and pipelines.



PHI end-finishing machines are the end result of more than forty years experience in producing tube-processing equipment (as Leonard Precision until 1969 and as Conrac's Machine Tool Division until 1985).

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 setup procedures with minimum time loss in small-lot production changeover. The PHI designs also permit 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 you that our rigid quality specifications are met on every item we ship.

	2C, 2CP & 2CPV	3CPV	8CPV
Flaring	Annealed ferrous & stainless steel: 1/8"-2" OD x .049" max.WT Nonferrous: 1/8"-2" OD x .065" max.WT	Annealed ferrous & nonferrous: 1/8"-3" OD x .125" max.WT Stainless steel: 3/8"-3" OD x .125" max.WT	Annealed ferrous, non-ferrous, & stainless steel: 1-1/4" - 8" OD x .125" max. WT
Beading	Annealed ferrous & nonferrous: 1/4"-3/8" OD x .035" max.WT Annealed ferrous & stainless: 1/2"-1-1/2" OD x .049" max.WT Nonferrous: 1/2"-1-1/2" OD x .065" max.WT	Annealed ferrous & nonferrous: 1/4"-3/8" OD x .035" max.WT 1/2"-1-1/2" OD x .065" max.WT Stainless steel: 1/2"-1-1/2" OD x .065" max.WT	Annealed ferrous, nonferrous, & stainless steel: 1-1/4"-8" OD x .065" max.WT Bead ht. adjustable 3/8" max Semi-automatic bead cycle 1-1/4" OD and up.
Squaring & Deburring	Annealed ferrous, nonferrous, & stainless steel: 1/8" - 2" OD	Annealed ferrous, nonferrous, & stainless steel: 1/8" - 3" OD	Annealed ferrous, nonferrous, & stainless steel: 1-1/4" - 8" OD
Spindle Speed	2C & 2CP: 2-speed spindle 500 and 1500 RPM 2CPV: Vari-speed motor 0-2000 RPM	Vari-speed motor 10-1750 RPM	Vari-speed drive 70-550 RPM
Clamping	2C: Manual lever 2CP & 2CPV: Semi-automatic air cylinder clamping with "PROTEC JAWS." Air supply 1-1/2 CFM at 75-100 PSI required.	Semi-automatic air cylinder clamping with "PROTEC JAWS." Air supply 1-1/2 CFM at 75-100 PSI required.	Pneumatic cylinder Heavy-duty overhead jaw linkage
Electrical	2C & 2CP: 1/2 HP motor 2CPV: 3/4 HP motor	3 HP motor	3 HP motor Magnetic starter Fused disconnect
Dimensions	28" x 18" x 15" (LxWxH)	39" x 28" x 45" (LxWxH)	68" x 35" x 54" (L x W x H) Floor-to-spindle C/L, 41"
Shipping Weight	2C: 300 pounds 2CP & 2CPV: 350 pounds	850 pounds	2200 pounds
Options	Cabinet stand	Semi-automatic powered beading cycle to 3" OD Manual beading cycle to 3" OD Digital display to read motor RPM	

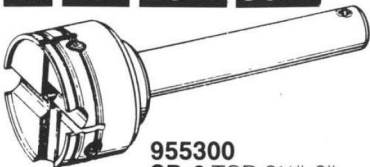


SQUARING / DEBURRING Models 2C, 2CP, 2CPV, 3CPV, 8CP

SQUARING & DEBURRING HEADS

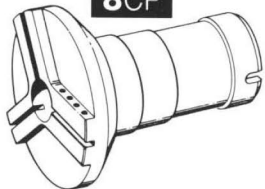
105002 TOD 1/4"-2" (SB-1)
(Use K-1 or TK-1 blades.)

2C 2CP 2CPV 3CPV¹



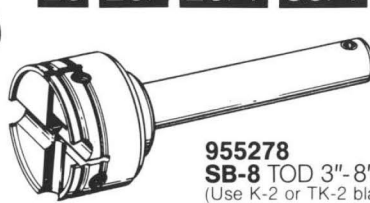
955300
SB-6 TOD 2 1/4"-6"
(Use K-2 or TK-2 blades.)

8CP



105003 TOD 5/8"-2" (SB-2)
(Use K-2 or TK-2 blades.)

2C 2CP 2CPV 3CPV²



955278
SB-8 TOD 3"-8"
(Use K-2 or TK-2 blades.)

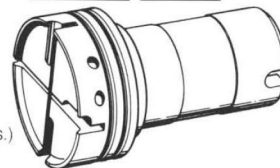
8CP



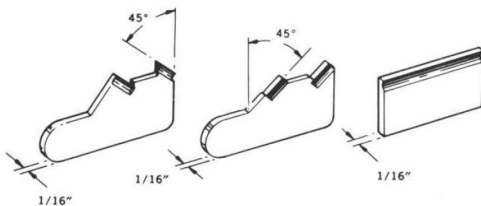
104930-1/16" TOD 1 1/4"-3" (SB-3)
(Use K-1 or TK-1 blades.)

107641 TOD 1 1/4"-3" (SB-3)
(Use K-2 or TK-2 blades.)

3CPV 8CP³



SQUARING & DEBURRING BLADES Available in sets of 3 or individually. A set includes one outside, one inside and one squaring blade. Standard cutting angles are 45° and 37°. Other angles are available on special order.



K-1 High Speed Steel Blades 1/16"

Set 900020-45 or -37 1/4" MIN. OD

Individual Outside Deburring Blade 900000-45 or -37
Inside Deburring Blade 900001-45 or -37
Squaring Blade 900002

TK-1 Cast Alloy Blades 1/16"

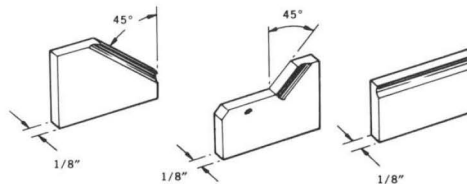
Set 900021-45 or -37 1/4" MIN. OD

Individual Outside Deburring Blade 900003-45 or -37
Inside Deburring Blade 900004-45 or -37
Squaring Blade 900005

CK-1 Carbide Blades 1/16"

Set 900034-045 1/4" MIN. OD

Individual Outside Deburring Blade 900031-045
Inside Deburring Blade 900032-045
Squaring Blade 900033



K-2 High Speed Steel Blades 1/8"

Set 900022-45 or -37 5/8" MIN. OD

Individual Outside Deburring Blade 900006-45 or -37
Inside Deburring Blade 900007-45 or -37
Squaring Blade 900008

TK-2 Cast Alloy Blades 1/8"

Set 900023-45 or -37 5/8" MIN. OD

Individual Outside Deburring Blade 900009-45 or -37
Inside Deburring Blade 900010-45 or -37
Squaring Blade 900011

1. For 3CPV use Spindle Adaptor 103645
2. For 3CPV and 8CP use Spindle Adaptor 103645
3. For 8CP use Spindle Adaptor 104454

