

Wart

MILLHOG®

Right Angle I.D. Clamping
Tube and Pipe Beveling Tool
0.750" I.D. to 4.5" O.D.
19.1 mm I.D. to 114.3 mm O.D.

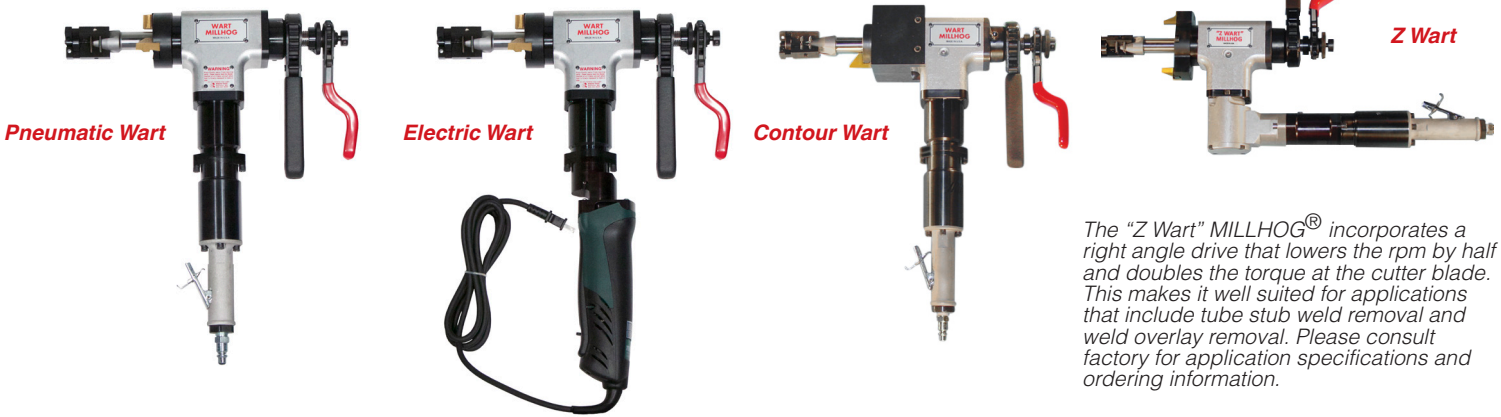
Key Features

- Only 2.625" (66.68mm) wide fits between tubes for single tube beveling
- Bevel, face and bore simultaneously
- No cutting lubricant required
- Available with pneumatic or electric drive motor that easily interchange
- Torque-free operation prevents operator fatigue
- Heavy duty ratchet wrench and knurled knob allows easy clamping and is perfect for limited access areas
- Mounts rigidly to produce a clean, continuous chip
- Lightweight and requires no special training
- Efficient chatter-free EscoLock cutter blade locking design directs heat away from tube surface and bevel blade cutting edge
- Low maintenance

Boilermaker proven, legendary reliability

The ESCO Wart MILLHOG® is a portable right angle I.D. clamping pipe and tube beveling tool that features an efficient low maintenance design. Incorporating a gear drive that is fully supported by dual opposed tapered roller bearings and three heavy duty ball bearings. This gives the Wart the backbone to satisfy a wide variety of applications and is a favorite choice among boilermakers and pipefitters.

All components are made of the finest materials and parts subject to wear are heat treated for durability and long use. Sealed construction prevents debris from getting inside the tool, allowing use in any orientation. What's more the compact design requires a minimum of 2.625" to fit between tubes in a boiler tube waterwall.



The "Z Wart" MILLHOG® incorporates a right angle drive that lowers the rpm by half and doubles the torque at the cutter blade. This makes it well suited for applications that include tube stub weld removal and weld overlay removal. Please consult factory for application specifications and ordering information.



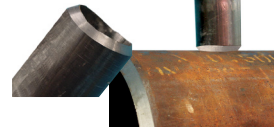
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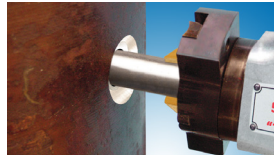
Tube overlay is efficiently removed from the O.D. and the end is simultaneously beveled.



Trimming tubes to length.



Fish mouth contours tube to fit evenly on header radius.



Strength weld removal prepares the surface for welding the new tube into place using the "Z Wart".



Tube overlay is efficiently removed from the tube O.D. and the tube end simultaneously beveled in preparation for welding.



Bolt hole resurfacing is prepared using a standard Wart MILLHOG and cutter blades.

Specifications: Wart MILLHOG®

Working Range	.750in (19.1 mm) I.D. to 4.5in (114.3 mm) O.D.			
Motor	Pneumatic	Electric	Contour	"Z" wart
Speed	1.25 hp (932 W) 90 psi (6.2 bar) 40 cfm (1133 lt/min) 98 rpm (49 rpm "Z" Wart)	120 V 8.5 A 50/60 Hz 950 W, or 220 - 240 V 4.4 A 50/60 Hz 950 W 55 rpm - 88 rpm	1.25 hp (932 W) 90 psi (6.2 bar) 40 cfm (990 lt/min) 98 rpm	1.25 hp (932 W) 90 psi (6.2 bar) 40 cfm (990 lt/min) 49 rpm
Minimum Clearance	2.625in (66.68 mm)	2.625in (66.68 mm)	5in (127 mm)	2.625in (66.68 mm)
Head Length	15.25in (387.4 mm)	15.25in (387.4 mm)	15.25in (387.4 mm)	15.25in (387.4 mm)
Working Weight	21.5 lbs (9.75 kg)	22.6 lbs (10.25 kg)	28 lbs (12.7 kg)	60 lbs (27.2 kg)
Shipping Weight	55 lbs (25 kg)	60 lbs (27.3kg)	65 lbs (29.5kg)	70 lbs (31.2 kg)
Shipping Dimensions	(24in x 20in x 6in) (610 mm x 508 mm x 152 mm)	(24in x 20in x 7in) (610 mm x 508 mm x 178 mm)	(24 in x 20 in x 7 in) (610 mm x 508 mm x 178 mm)	27in x 21in x 7in 686 mm x 534 mm x 178 mm

U.S. Patent 5,531,550 & 7,938,047

Applications beyond tube end preparation

- Tube and pipe beveling
- Remove cladding, weld overlay and membrane from tube
- Face tubes to length
- Tube stub and seal weld removal
- Contour tube end preparation
- Bolt hole resurfacing

Three Mandrels are offered with the 1.25" standard. The 1.0" and 0.75" Mandrels can be substituted or ordered as optional equipment.

Wart Clamp Rib Selector and corresponding spares Mandrel, Draw Rod, Actuator, Roll Pin, Retention Band and Springs

Clamp Rib Set	I.D. Range		Mandrel		Draw Rod	Actuator	Roll Pin	Retention	
	in	mm	Part #	Size				Band	Spring
G-03A	.750	.905	19.1	22.9	H-241	.750	H-247	G-17	G-15 G-14F
G-04	.875	1.030	22.3	26.1	H-241	.750	H-247	G-17	G-15 G-14
G-05	1.000	1.155	25.4	29.3	H-241	.750	H-247	G-17	G-15 G-14
G-06	1.125	1.280	28.6	32.5	H-241	.750	H-247	G-17	G-15 G-14
G-07	1.250	1.405	31.8	35.6	H-241	.750	H-247	G-17	G-15 G-14
G-08	1.375	1.530	35.0	38.8	H-241	.750	H-247	G-17	G-15 G-14
G-09	1.500	1.655	38.1	42.0	H-241	.750	H-247	G-17	G-15 G-14
G-10	1.625	1.780	41.3	45.2	H-241	.750	H-247	G-17	G-15 G-14
G-11	1.750	1.905	44.5	48.3	H-241	.750	H-247	G-17	G-15 G-14
G-12	1.875	2.030	47.7	51.5	H-241	.750	H-247	G-17	G-15 G-14
G-13	2.000	2.155	51.0	54.7	H-241	.750	H-247	G-17	G-15 G-14
H-00	1.000	1.300	25.4	33.0	H-220	1.00	H-51	H-12A	H-11 H-14A
H-01	1.250	1.600	31.8	40.6	H-21	1.25	H-51	H-12	H-11 H-14B
H-02	1.525	1.925	28.8	48.9	H-21	1.25	H-51	H-12	H-11 H-14B
H-03	1.850	2.250	47.0	57.2	H-21	1.25	H-51	H-12	H-11 H-14B
H-04	2.175	2.575	55.3	65.4	H-21	1.25	H-51	H-12	H-11 H-14B
H-02 & H-05	2.500	2.900	63.5	73.7	H-21	1.25	H-51	H-12	H-11 H-14B
H-03 & H-05	2.825	3.225	71.8	81.9	H-21	1.25	H-51	H-12	H-11 H-14B
H-04 & H-05	3.150	3.550	80.0	90.2	H-21	1.25	H-51	H-12	H-11 H-14B
H-02 & H-08	3.475	3.875	88.3	98.4	H-21	1.25	H-51	H-12	H-11 H-14B
H-03 & H-08	3.800	4.200	96.6	106.6	H-21	1.25	H-51	H-12	H-11 H-14B
H-04 & H-08	4.125	4.525	104.8	114.9	H-21	1.25	H-51	H-12	H-11 H-14B

G Series Clamp Ribs work on the 0.75" Mandrel



H-0 Clamp Ribs work on the 1.0" Mandrel.



H-01 thru H-04 Clamp Ribs and H-05 and H-08 work on the 1.25" Mandrel.



Wart Cutterheads and Parts

Cutterhead Part #	Size	Mandrel		Blade Lock		Blade Screw	
		Part #	Size	Part #	Per Head	Part #	Per Lock
H-242	2.625	H-241	.750	H-22	3	H-23	1
CH-20	2.625	H-220 or H-21	1.00 or 1.250	H-22B	3	H-23	1
CH-21	3.00	H-21	1.250	H-22C	3	H-23	1
CH-22	3.50	H-21	1.250	H-22A	6	H-23	1
CH-23	4.00	H-21	1.250	H-22A	3	H-23	1
				H-22C	3	H-23	1
CH-24	4.50	H-21	1.250	H-22C	6	H-23	1



Membrane Removal Heads

Membrane Head Size	Membrane Head Part #	Base Head Part#	Inserts Part #	Qty
2	MO-110	HB-110	MRB-8	6
2.125	MO-111	HB-110	MRB-8	6
2.25	MO-112	HB-110	MRB-8	6
2.5	MO-113	HB-110 or HB-114	MRB-8	7
2.75	MO-114	HB-114	MRB-8	7
3	MO-115	HB-114	MRB-8	8

Overlay and Membrane Removal Heads

Overlay Head Size	Overlay Head Part #	Base Head Part#	Inserts Part #	Qty
2	MO-210	HB-110	MRB-8	6
2.125	MO-211	HB-110	MRB-8	6
2.25	MO-212	HB-110	MRB-8	6
2.5	MO-213	HB-110 or HB-114	MRB-8	7
2.75	MO-214	HB-114	MRB-8	7
3	MO-215	HB-114	MRB-8	8

