



Photos courtesy of Mathey Dearman, Inc.

Plasma cutting application

## Pipeline cutting and beveling

### Examples of plasma uses

#### Pipe fit-up

Powermax systems with machine torches can be mounted on a variety of portable cutting devices such as saddle, magnetic or chain machines to cut and bevel pipe from 38 mm (1-1/2") to an unlimited outside diameter with wall thicknesses up to 25 mm (1"). Powermax systems can be powered by motor generators at sites where fixed power is unavailable, and portable compressors or bottled air may be used as the gas source.

Systems: Powermax45, 65, 85, 105 or 125

#### Pipe repair or dismantling

Powermax systems with hand or machine torches are used to gouge welded joints for dismantling of pipe or re-welding for x-ray. Plasma gouging provides reduced noise and smoke over other thermal gouging methods. Unlike with carbon-arc gouging there is no risk of metallurgical problems (e.g. high hardness or cracking) from carbon contamination.

Systems: Powermax45, 65, 85, 105 or 125

#### Key advantages of Powermax® systems

- Fast speeds results in shorter cut times and greater productivity over processes than with oxyacetylene and cold sawing.
- Narrower kerf than with oxyacetylene results in less welding and lower wire costs.
- High cut quality reduces or eliminates secondary operations, such as grinding.
- Controlled arc and high cutting speeds reduce heat-affected zone and warping.
- Cut a variety of metals including mild steel, stainless and aluminum – painted or rusted.
- No need to preheat the pipe before cutting.

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## Comparison of Powermax plasma to oxyacetylene

Plasma's fast cutting speed and higher cut quality reduces the cost of cutting pipe and enables the job to be done faster. See how this is illustrated in the following example.

### Example

Pipe: 324 mm (12-3/4") OD, Schedule 80 with 17 mm (.687") nominal wall thickness and a 1 m (40") circumference.

Equipment: Powermax105 with machine torch on a Mathey Dearman motorized saddle machine, model 2SA  
Oxyacetylene torch on a Mathey Dearman motorized saddle machine, model 2SA.

Cut speeds	Powermax105	Oxyacetylene
Time to complete one 37-1/2° bevel cut	60 seconds	180 seconds
Number of cuts per hour	60	20

### Productivity advantage

With its faster speed the Powermax105 can complete 40 more cuts per hour than oxyacetylene can. This increased productivity creates the potential for additional profit.

Operating cost	Powermax105	Oxyacetylene
Operating cost per hour	\$ 37.10	\$ 53.68
Electrode and nozzle for 1 hour	\$ 5.54*	\$ 0.06
Power	\$ 1.56	\$ 0.00
Gas	\$ 0.00	\$ 23.62**
Labor and OH	\$ 30.00	\$ 30.00
Total operating cost for 8 hours of cutting	\$296.80	\$429.44
Total operating cost per linear foot	\$ 0.185	\$ 0.80
Total dollar savings for 8 hours	\$132.64 saved by using the Powermax105 (\$429.44-\$296.80)	

\* \$5.54 = 1/2.24 x cost of electrode and nozzle x 80% duty cycle. This is based on testing that indicates average Powermax105 consumable life to be 2.24 arc hours. Our example is based on 1 hour with 80% arc on time.

\*\* Cost based on acetylene flow rate of .23 per minute at \$6.28 per hour and oxygen flow rate of 2.5 per minute at \$17.33 per hour.

### Profitability results

In this example, the Powermax105 saves \$132.64 per 8 hour shift. To really complete the cost comparison picture, you will also want to consider the cost that secondary operations, such as grinding can add to each cut. The cost for secondary operations is usually the labor involved, so the amount time spent multiplied by the labor rate will show the savings.

### Basic system specifications

	Powermax45	Powermax65	Powermax85	Powermax105	Powermax125
Maximum mechanized pierce capacity	10 mm (3/8")	12 mm (1/2")	16 mm (5/8")	22 mm (7/8")	25 mm (1")
Output current (amps)	20-45	20-65	25-85	30-105	30-125
Input voltage	200 / 240 V, 1-PH	CSA 200-480 V, 1-PH CSA 200-600 V, 3-PH CE 400 V, 3-PH	CSA 200-480 V, 1-PH CSA 200-600 V, 3-PH CE 400 V, 3-PH	CSA 200-600 V, 3-PH CE 230-400 V, 3-PH CE 400 V, 3-PH CCC 380 V, 3-PH	CSA 480 V, 3-PH CSA 600 V, 3-PH CE 400 V, 3-PH CCC 380 V, 3-PH
Duty cycle at full output *	50%	40-50%	40-60%	70-80%	100%
Engine drive rating for full arc stretch	8 kW	15 kW	20 kW	30 kW	40 kW
Weight	16.8 kg (37 lbs)	29 kg (64 lbs)	32 kg (71 lbs)	45 kg (100 lbs)	49 kg (105 lbs)
Size (D x W x H)	426 x 348 x 172 mm (16.8 x 13.7 x 6.8")	500 x 234 x 455 mm (19.7 x 9.2 x 17.9")	500 x 234 x 455 mm (19.7 x 9.2 x 17.9")	592 x 274 x 508 mm (23.3 x 10.8 x 20.0")	592 x 274 x 508 mm (23.3 x 10.8 x 20.0")

\* Volt/phase dependant