

## Carbon Steel Solid Wires for MIG/MAG

### ER70S-3:

A silicon and manganese deoxidized wire used for mild and low alloy steel general purpose fabrication. Silicon and manganese serve as deoxidizers. Good for out-of-position welding using short circuiting transfer with 75% Ar + 25% CO<sub>2</sub> or CO<sub>2</sub> shielding gases. Good performance over mill scale and rust.

### ER70S-6:

Highest combination of manganese and silicon deoxidizers, for stronger deoxidizing power where stringent cleaning procedures are not possible. The high silicon content increases the fluidity of the weld pool, creating a smoother bead appearance and resulting in minimal post-weld grinding.

| AWS Classification | Size (INCH) | Part No. 2 lb Spool | Part No. 11 lb Spool | Part No. 33 lb Spool |
|--------------------|-------------|---------------------|----------------------|----------------------|
| ER70S-3            | .030        | S3-030-2            |                      |                      |
|                    | .035        | S3-035-2            |                      |                      |
|                    | .045        | S3-045-2            |                      |                      |
| ER70S-6            | .023        | S6-023-2            | S6-023-11            |                      |
|                    | .030        | S6-030-2            | S6-030-11            | S6-030-33            |
|                    | .035        | S6-035-2            | S6-035-11            | S6-035-33            |
|                    | .045        | S6-045-2            | S6-045-11            | S6-045-33            |



#### HELPFUL HINT:

An increase in wire feed speed will increase your amperage.

#### Typical Mechanical Properties

| TS (PSI) | YS (PSI) | ELONG % | FT LBS @-20°F |
|----------|----------|---------|---------------|
| 78,000   | 63,000   | 25      | 32            |
| 84,000   | 71,000   | 26      | 43            |

#### Chemical Compositions (Percentages)

| AWS Classification | C            | Mn           | Si           | P     | S     |
|--------------------|--------------|--------------|--------------|-------|-------|
| ER70S-3            | 0.06 to 0.15 | 0.90 to 1.40 | 0.45 to 0.70 | 0.025 | 0.035 |
| ER70S-6            | 0.07 to 0.15 | 1.40 to 1.85 | 0.80 to 1.15 | 0.025 | 0.035 |

NOTE:  
Single values shown are maximum. Ni, Cr, Mo and V may be present but are not intentionally added. The maximum weight of copper due to any coating plus the residual copper content in the steel shall be .50.

## Self-Shielded Flux Cored Wires



| AWS Classification | Size (INCH) | 2 lb. Spool Part No. | 10 lb. Spool Part No. | 25 lb. Spool Part No. |
|--------------------|-------------|----------------------|-----------------------|-----------------------|
| E71T-GS            | .030        | 71-030-2             | 71-030-10             | 71-030-25             |
|                    | .035        | 71-035-2             | 71-035-10             | 71-035-25             |
|                    | .045        | 71-045-2             | 71-045-10             | 71-045-25             |

This flux cored wire is for single pass welding of mild and low alloy steels in all positions. Travel speed is rapid and weld edges are smooth.

#### HELPFUL HINTS:

Use DC-Polarity; minimizes the risk of burn through.  
50-90 amps for .030 size, 110-130 amps for .035 size.



## Universal Welding Wire Spool Adapter

The universal welding wire spool adapter quickly adapts most wirefeeders and integrated MIG machines to use a 4" (1lb. or 2 lb.) spool without removing or altering the standardized 2 inch spindle assembly. It locates the small spool close to the wire inlet of the wirefeeder which promotes a smoother feed of wire.

Part No. OUSA

## Welding Wire

### Aluminum Solid Wires

#### ER4043:

5% Si bare Aluminum welding wire, flows freely at 1155°F. Recommended for welding 3003, 3004, 5052, 6061, 6063, casting alloys 43, 355, 356, 214.

#### ER5356:

5356, 5% Mg bare Aluminum welding wire, flows freely at 1180°F. Recommended for joining 5050, 5052, 5083, 5454, and 5456.



#### Spools

| AWS Classification | Size (INCH) | Part No. 1 lb Spool | Part No. 12 lb Spool | Part No. 16 lb Spool |
|--------------------|-------------|---------------------|----------------------|----------------------|
| ER4043             | .030        | 4043-030-1          | 4043-030-12          |                      |
|                    | .035        | 4043-035-1          |                      | 4043-035-16          |
|                    | 3/64        | 4043-364-1          |                      | 4043-364-16          |
|                    | 1/16        | 4043-116-1          |                      | 4043-116-16          |
| ER5356             | .030        | 5356-030-1          | 5356-030-12          |                      |
|                    | .035        | 5356-035-1          |                      | 5356-035-16          |
|                    | 3/64        | 5356-364-1          |                      | 5356-364-16          |
|                    | 1/16        | 5356-116-1          |                      | 5356-116-16          |

#### Cut Lengths

| AWS Classification | Size (INCH) | 10 lb. TB<br>40 lb. Box | 1 lb. TB      |
|--------------------|-------------|-------------------------|---------------|
| ER4043             | 1/16        | 4043-116-36             | 4043-116-36-1 |
|                    | 3/32        | 4043-332-36             | 4043-332-36-1 |
|                    | 1/8         | 4043-18-36              | 4043-18-36-1  |
| ER5356             | 1/16        | 5356-116-36             | 5356-116-36-1 |
|                    | 3/32        | 5356-332-36             | 5356-332-36-1 |
|                    | 1/8         | 5356-18-36              | 5356-18-36-1  |

### Chemical Compositions (Percentages)

| AWS Class. | Si      | Fe   | Cu   | Mn        | Mg      | Cr        | Zn   | Ti        | Others | Al  |
|------------|---------|------|------|-----------|---------|-----------|------|-----------|--------|-----|
| ER4043     | 4.5-6.0 | 0.80 | 0.30 | 0.05      | 0.05    | --        | 0.10 | 0.20      | 0.15   | Rem |
| ER5356     | 0.25    | 0.50 | 0.10 | 0.05-0.20 | 4.5-5.5 | 0.05-0.20 | 0.10 | 0.06-0.20 | 0.15   | Rem |

Single values shown are maximum percentages, unless otherwise specified.

### Gas Welding Rods

**RG45:** This is a copper coated, iron based low alloy steel rod, predominately used for torch welding mild steel alloys. This alloy offers very good machinability and ductility for ordinary purposes, where a minimum tensile strength is often used for gas fusion welding of plate, sheet, structural shapes, pipe and castings.

**RG60:** This is a steel rod used for torch welding of various carbon steels. These rods consistently produce medium to high quality welds.

**SILICON BRONZE:** A copper silicon manganese alloy, suitable for welding copper and other copper alloys, and for many sheet metal applications employing plain and galvanized steel. Melting point 1866°F.

**LOW FUMING BRONZE:** A low-fuming oxy-acetylene brazing rod extensively used for joining of steels and overlaying of cast iron. The fuming qualities and good mechanical properties make this a widely used general purpose rod. Melting point 1620°F.

| AWS Classification | Size (INCH) | 50 lb. Box | 1 lb. TB    | 5 lb. TB    |
|--------------------|-------------|------------|-------------|-------------|
| R45 (RG45)         | 1/16        | 45-116-36  | 45-116-36-1 | 45-116-36-5 |
|                    | 3/32        | 45-332-36  | 45-332-36-1 | 45-332-36-5 |
|                    | 1/8         | 45-18-36   | 45-18-36-1  | 45-18-36-5  |
|                    | 5/32        | 45-532-36  |             |             |
|                    | 3/16        | 45-316-36  |             |             |
| R60 (RG60)         | 1/16        | 60-116-36  | 60-116-36-1 |             |
|                    | 3/32        | 60-332-36  | 60-332-36-1 |             |
|                    | 1/8         | 60-18-36   | 60-18-36-1  |             |
|                    | 5/32        | 60-532-36  |             |             |
|                    | 3/16        | 60-316-36  |             |             |

| Description                   | Size  | Part No.                  | 1 lb. TB      | 5 lb. TB     |
|-------------------------------|-------|---------------------------|---------------|--------------|
| Silicon Bronze                | 1/16" | 10 lb. TB<br>656-116-36   |               |              |
|                               | 3/32" | 40 lb. Box<br>656-332-36  |               |              |
|                               | 1/8"  | 656-18-36                 |               |              |
| Low Fume Bronze Bare          | 1/16" | 50 lb. Bulk<br>681-116-36 | 681-116-36-1  | 681-116-36-5 |
|                               | 3/32" | 681-332-36                | 681-332-36-1  | 681-332-36-5 |
|                               | 1/8"  | 681-18-36                 | 681-18-36-1   | 681-18-36-5  |
|                               | 5/32" | 681-532-36                |               |              |
|                               | 3/16" | 681-316-36                |               |              |
| Low Fume Bronze (Flux Coated) | 3/32" | 10 lb. TB<br>681C-332-36  | 681C-332-36-1 |              |
|                               | 1/8"  | 50 lb. Box<br>681C-18-36  | 681C-18-36-1  |              |
|                               | 1/16" | 681C-116-36-1             |               |              |

### Chemical Compositions (Percentages)

| AWS Class                     | C        | Cu   | Zn      | Sn        | Mn        | Fe        | Si        | P     | Al   | Pb |
|-------------------------------|----------|------|---------|-----------|-----------|-----------|-----------|-------|------|----|
| RG45                          | .08      | .30  | -       | .04       | .50       | Rem       | 0.10      | 0.035 | 0.02 | -  |
| RG60                          | .16      | .30  | -       | .035      | 0.90-1.40 | Rem       | 0.10-0.35 | 0.035 | -    | -  |
| Description                   | Cu       | Zn   | Sn      | Mn        | Fe        | Si        | P         | Al    | Pb   |    |
| Silicon Bronze Bare           | 94.0 min | 1.50 | 1.50    | 1.50      | 0.05      | 2.8-4.0   | 0         | 0.01  | 0.02 |    |
| Low Fuming Bronze Bare        | 56.60    | Bal  | 0.8-1.1 | 0.01-0.50 | 0.25-1.20 | 0.04-0.15 | 0         | 0.01  | 0.05 |    |
| Low Fuming Bronze Flux Coated | 56.60    | Bal  | 0.8-1.1 | 0.01-0.50 | 0.25-1.20 | 0.04-0.15 | 0         | 0.01  | 0.05 |    |

## Stainless Steel Solid Wires

### 308L:

308L contains an average .03% carbon, producing a weld deposit with good resistance against intergranular corrosion caused by carbide precipitation. 308L is commonly used for welding AISI types 304L, 308L, 321, and 347.

### 308LSi:

308LSi has a higher silicon content along with a low carbon content. The increased silicon level provides better arc stability and a smoother bead appearance while an average .03% carbon level reduces carbide precipitation. 308LSi produces excellent quality fillet and butt welds. Typical applications would include those of 308 and 308L welding wires.

### 309L:

309L contains an average .03% carbon to provide a weld deposit that will offer good resistance against intergranular corrosion caused by carbide precipitation. 309L is excellent for buttering passes and overlay work. Typical applications include those of 309 welding wire.

### 316L:

316L is used for welding AISI 316L stainless that may be exposed to organic and inorganic acids. The addition of .03% carbon produces a weld deposit with excellent resistance against intergranular corrosion caused by carbide precipitation.

### 316LSi:

316LSi has a higher silicon content along with a low carbon content, producing better arc stability, smoother bead appearance and excellent resistance to carbide precipitation. 316LSi is used for welding austenitic acid-resistant steels such as those containing 18% Cr, 8% Ni, 2-3% Mo.

## SPOOLS

| AWS Classification | Size | 2 lb. Spools | 10 lb. Spools              | 30 lb. Spools                             |
|--------------------|------|--------------|----------------------------|---|
| ER308L             | .030 | 308L-030-2   | 308L-030-10                | 308L-030-30<br>308L-035-30<br>308L-045-30 |
|                    | .035 |              |                            |   |
|                    | .045 | 308L-023-10  |                            |   |
|                    | .023 |              |                            |   |
| ER308LSi           | .030 |              |                            | 308LHS-035-30<br>308LHS-045-30            |
|                    | .035 |              |                            |   |
| ER309L             | .023 |              | 309L-023-10<br>309L-030-10 | 309L-035-30<br>309L-045-30                |
|                    | .030 |              |                            |   |
|                    | .035 |              |                            |   |
| ER316L             | .023 |              | 316L-023-10<br>316L-030-10 | 316L-035-30<br>316L-045-30                |
|                    | .030 |              |                            |   |
|                    | .035 |              |                            |   |
|                    | .045 |              |                            |   |

## CUT LENGTHS

| AWS Classification | Size (INCH) | Part No.    | 1 lb. TB      |
|--------------------|-------------|-------------|---------------|
| ER308L             | 1/16        | 308L-116-36 | 308L-116-36-1 |
|                    | 3/32        | 308L-332-36 | 308L-332-36-1 |
|                    | 1/8         | 308L-18-36  | 308L-18-36-1  |
| ER309L             | 1/16        | 309L-116-36 |               |
|                    | 3/32        | 309L-332-36 |               |
|                    | 1/8         | 309L-18-36  |               |
| ER316L             | 1/16        | 316L-116-36 |               |
|                    | 3/32        | 316L-332-36 |               |
|                    | 1/8         | 316L-18-36  |               |

Stainless Steel Rods are 36" cut lengths/10 lbs. per box; 30 lbs. per master

## Chemical Compositions (Percentages)

| AWS Class. | C    | Cr        | Ni        | Mo      | Mn      | Si        | P    | S    | Fe  | Cu   |
|------------|------|-----------|-----------|---------|---------|-----------|------|------|-----|------|
| ER308L     | 0.03 | 19.5-22.0 | 9.0-11.0  | 0.75    | 1.0-2.5 | 0.30-0.65 | 0.03 | 0.03 | Rem | 0.75 |
| ER308LSi   | 0.03 | 19.5-22.0 | 9.0-11.0  | 0.75    | 1.0-2.5 | 0.65-1.00 | 0.03 | 0.03 | Rem | 0.75 |
| ER309L     | 0.03 | 23.0-25.0 | 12.0-14.0 | 0.75    | 1.0-2.5 | 0.30-0.65 | 0.03 | 0.03 | Rem | 0.75 |
| ER316L     | 0.03 | 18.0-20.0 | 11.0-14.0 | 2.0-3.0 | 1.0-2.5 | 0.30-0.65 | 0.03 | 0.03 | Rem | 0.75 |
| ER316LSi   | 0.03 | 18.0-20.0 | 11.0-14.0 | 2.0-3.0 | 1.0-2.5 | 0.65-1.00 | 0.03 | 0.03 | Rem | 0.75 |

Single values shown are maximum percentages, unless otherwise specified

## TIG Rod

| AWS Classification | Size (INCH) | 10 lb. TB<br>30 lb. Box | 1 lb. TB    |
|--------------------|-------------|-------------------------|-------------|
| ER70S-2            | .035        | S2-035-36               |             |
|                    | .045        | S2-045-36               |             |
|                    | 1/16        | S2-116-36               | S2-116-36-1 |
|                    | 3/32        | S2-332-36               | S2-332-36-1 |
|                    | 1/8         | S2-18-36                | S2-18-36-1  |
| ER70S-6            | 1/16        | S2-116-36               |             |
|                    | 3/32        | S2-332-36               |             |
|                    | 1/8         | S2-18-36                |             |

### ER70S2

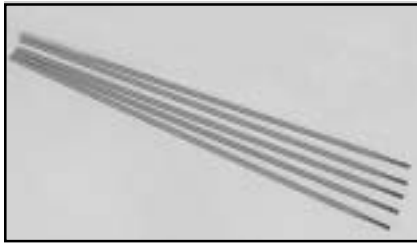
This is a premium TIG wire for welding on all grades of mild and carbon steels, producing quality welds with minimal porosity. It contains 5 deoxidizers (Manganese, Silicon, Zirconium, Titanium and Aluminum) which make it an excellent choice for welding over rust and mill scale. No flux required. This product is embossed on both ends for easy identification.

### ER70S6

This is a mild steel welding wire that contains higher levels of manganese and silicon than other standard grades of MIG wire to produce high quality welds when used on dirty, oily or rusty steel. A higher silicon content increases the fluidity of the weld pool, creating a smoother bead resulting in minimal post-weld grinding. This wire is engineered to provide porosity-free, x-ray quality welds at the highest tensile strength (as welded) of all the plain carbon steel wires.

\* This product require the use of CO<sub>2</sub> as a shielding gas.

## Stick Electrodes



| AWS Classification | Size (INCH) | 1 lb. Box Part No. | 5 lb. Box Part No. |
|--------------------|-------------|--------------------|--------------------|
| E6011              | 3/32        | 6011-332-1         | 6011-332-5         |
|                    | 1/8         | 6011-18-1          | 6011-18-5          |
|                    | 5/32        |                    | 6011-532-5         |
| E6013              | 3/32        | 6013-332-1         | 6013-332-5         |
|                    | 1/8         | 6013-18-1          | 6013-18-5          |
|                    | 5/32        |                    | 6013-532-5         |
| E7014              | 3/32        |                    | 7014-332-5         |
|                    | 1/8         |                    | 7014-18-5          |
|                    | 5/32        |                    | 7014-532-5         |
| E7018              | 3/32        |                    | 7018-332-5         |
|                    | 1/8         |                    | 7018-18-5          |
|                    | 5/32        |                    | 7018-532-5         |
| E7018AC            | 3/32        |                    | 7018AC-332-5       |
|                    | 1/8         |                    | 7018AC-18-5        |
|                    | 5/32        |                    | 7018AC-532-5       |
| E7024              | 3/32        |                    | 7024-332-5         |
|                    | 1/8         |                    | 7024-18-5          |
|                    | 5/32        |                    | 7024-532-5         |
| E316L-16           | 3/32        | 316L-16-332-1      |                    |
|                    | 1/8         | 316L-16-18-1       |                    |
|                    | 5/32        | 316L-16-532-1      |                    |
| NI-55<br>ENiFeCl   | 3/32        | NI55-332-1         |                    |
|                    | 1/8         | NI55-18-1          |                    |
| NI-99<br>ENiCl     | 3/32        | NI99-332-1         |                    |
|                    | 1/8         | NI99-18-1          |                    |

Single values shown are maximum percentages, unless otherwise specified.

### Chemical Compositions (Percentages)

| AWS Classification | C    | Mn      | Si   | P     | S     |
|--------------------|------|---------|------|-------|-------|
| E6011              | 0.08 | 0.45    | 0.18 | 0.014 | 0.015 |
| E6013              | 0.08 | 0.45    | 0.18 | 0.014 | 0.012 |
| E7014              | 0.12 | 0.68    | 0.33 | 0.021 | 0.012 |
| E7018              | 0.08 | 1.0     | 0.6  | 0.012 | 0.011 |
| E7024              | 0.06 | 0.81    | 0.43 | 0.018 | 0.019 |
| E316L-16           | 0.04 | 0.5-2.5 | 0.90 | 0.04  | 0.03  |

### Packaged Stick Electrodes

#### E6011:

Steel electrode offering excellent mechanical properties in the welding of mild steels, galvanized, and some low alloy steels. The coating produces a forceful, spray-type arc, resulting in deeply penetrating welds in all positions. The slag is thin and readily removable. Operates on AC or DCEP.

#### E6013:

Establishes a smooth, quiet, medium penetrating arc that is readily maintained with minimal spatter loss. The slag lifts easily, revealing a finely rippled bead contour. This quick freezing slag gives optimum performance in vertical-down welding. E6013 is ideally suited for general purpose welding, even with small AC and power sources having low open-circuit voltage. Works well on AC and DC.

#### E7014:

Has an iron powder covering. The iron powder content yields a high deposition rate in all positions. The welds reflect smooth beads with fine ripples. E7014 is particularly advantageous when poor fit-up exists. The slag is easily removed, often self lifting. E7014 operates on AC, DCEN or DCEP.

#### E7018:

Is an efficient, all position, iron powder, low hydrogen type electrode which exhibits excellent mechanical properties, crack resistance, and X-ray quality welds. This electrode offers a quiet, stable, low penetration, spatter-free arc. The moderately heavy slag is remarkably easy to remove, revealing a bead with distinct ripples. Operator appeal is a plus factor. Operates on AC or DCEP.

#### E7018AC:

This low-hydrogen type welding electrode is a version of E7018 specifically designed to have optimum characteristics when used with an AC power source. It is very easy to strike and has an extremely stable arc giving it excellent operator appeal. It welds exceptionally well on small, utility-type welders.

#### E7024:

Is a high speed, iron powder, heavy coated electrode for high deposition rates on horizontal and down hand welding. Excellent bead appearance and self-cleaning slag give it operator appeal. This electrode has good weldability and superior mechanical properties and is particularly useful in obtaining increased penetration with little or no root porosity in horizontal or positioned fillets.

#### E316L-16:

Used principally for welding molybdenum-bearing austenitic alloys containing 0.03% maximum carbon.

#### NI-55:

Nickel iron electrode for repairing large defects in cast iron, joining sections over 1/4" thick. For welding nodular, malleable and alloy cast irons; high-phosphorus castings.

#### NI-99:

Nickel electrode for repairing small defects in cast iron, welding thin cast iron sections together or to steel. Machinability and color match excellent.

**Valu-MIG Guns**



- Air Cooled Design
- Available in 250 and 400 AMP Models 15' cable
- Available with your choice of rear connections: Tweco, Lincoln or Miller

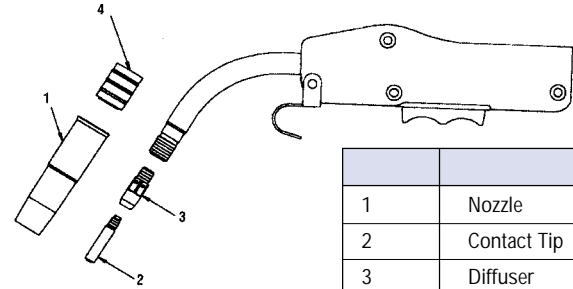
**250 AMP**

| Part No.       | Rear Connection | Diameter   | Cable Length |
|----------------|-----------------|------------|--------------|
| VM250-15-3035  | Tweco           | .030/.035" | 15'          |
| VM250M-15-3035 | Miller          | .030/.035" | 15'          |
| VM250L-15-3035 | Lincoln         | .030/.035" | 15'          |

**400 AMP**

| Part No.       | Rear Connection | Diameter   | Cable Length |
|----------------|-----------------|------------|--------------|
| VM400-15-3545  | Tweco           | .030/.045" | 15'          |
| VM400M-15-3545 | Miller          | .030/.045" | 15'          |
| VM400L-15-3545 | Lincoln         | .030/.045" | 15'          |

**Valu-MIG Breakdown**



| Number | Description      |
|--------|------------------|
| 1      | Nozzle           |
| 2      | Contact Tip      |
| 3      | Diffuser         |
| 4      | Nozzle Insulator |

**Tweco Selector Chart**

| Gun        | Contact Tip | Diffuser | Insulator    | Nozzle       |
|------------|-------------|----------|--------------|--------------|
| No. 1, 150 | VM 11       |          | -            | VM 21 Series |
| No. 2, 250 | VM 14, 14H  | VM 52    | VM 32        | VM 22 Series |
|            | VM 14H      | VM 52FN  | -            | VM 23 Series |
| No. 3, 300 | VM 14, 14H  | VM 54A   | -            | VM 23 Series |
| No. 4, 400 | VM 14, 14H  | VM 54A   | VM 34A, 34CT | VM 24 Series |

**Contact Tips**

| Product                  | Part No.                | Wire Size |        |
|--------------------------|-------------------------|-----------|--------|
|                          |                         | Inches    | Metric |
| <br>Use on Mini & #1 Gun | VM11-23                 | .023      | .6 mm  |
|                          | VM11-30                 | .030      | .8 mm  |
|                          | VM11-35                 | .035      | .9 mm  |
|                          | VM11-45                 | .045      | 1.2 mm |
| <br>Use on #2, 3, 4 Gun  | VM14-23                 | .023      | .6 mm  |
|                          | VM14-30                 | .030      | .8 mm  |
|                          | VM14-35                 | .035      | .9 mm  |
|                          | VM14-40                 | .040      | 1.0 mm |
|                          | VM14-45                 | .045      | 1.2 mm |
|                          | VM14-52                 | .052      | 1.3 mm |
| <br>Use on #2, 3, 4 Gun  | VM14H-35                | .035      | .9 mm  |
|                          | VM14H-40                | .040      | 1.0 mm |
|                          | VM14H-45                | .045      | 1.2 mm |
|                          | VM14H-52                | .052      | 1.3 mm |
|                          | VM14H-116               | 1/16      | 1.6 mm |
|                          | VM14H-564               | 5/64      | 2.0 mm |
|                          | <br>Use on #2, 3, 4 Gun | VM14T-30  | .030   |
| VM14T-35                 |                         | .035      | .9 mm  |
| VM14T-45                 |                         | .045      | 1.2 mm |
| VM14T-52                 |                         | .052      | 1.3 mm |
| VM14T-116                |                         | 1/16      | 1.6 mm |



**Liners**

| Part No.      | Length | Wire Size      | Gun     |
|---------------|--------|----------------|---------|
| VM42-3035-15  | 15'    | .030 - .035    | #1 & #2 |
| VM42-3035-25  | 25'    | .030 - .035    |         |
| VM42-4045-15  | 15'    | .040 - .045    |         |
| VM42-4045-25  | 25'    | .040 - .045    |         |
| VM42N-3545-15 | 15'    | .030 - .035 AL |         |
| VM44-116-15   | 15'    | .052 - 1/16    | #3 & #4 |
| VM44-116-25   | 25'    | .052 - 1/16    |         |
| VM44-3545-15  | 15'    | .035 - .045    |         |
| VM44-3545-25  | 25'    | .035 - .045    |         |
| VM44-564-15   | 15'    | 5/64           |         |
| VM44-564-25   | 25'    | 5/64           |         |

**Gas Diffusers**

| Product            | Part No. | Description  |
|--------------------|----------|--|
| <br>Part No. VM52  | VM35-50  | STD Mini-Mig Gun Diffuser use VM11 Tips                            |
|                    | VM52     | STD #2 Gun Diffuser use VM14 TIPS                                  |
|                    | VM52-23  | #2 Gun Diffuser, use with .023 wire use VM14 Tips                  |
| <br>Part No. VM54A | VM52FN   | #2 Gun Diffuser, use with #3 and #4 optional nozzles use VM14 Tips |
|                    | VM54A    | STD #3 & #4 Gun Diffuser use VM14 Tips                             |

**Nozzle Insulators - Threaded**

| Product            | Part No. | Description   |
|--------------------|----------|---|
| <br>Part No. VM34A | VM32     | Adjustable, for use with #2 Gun Nozzles   |
|                    | VM34A    | Adjustable, for use with #2 Gun (use with VM52FN Diffuser), #3 and #4 Gun Nozzles |
|                    | VM34CT   | For use with coarse thread nozzles, #2, #3, #4 Gun                                |

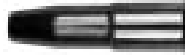
**Tweco Style Consumables**

**Nozzles**

**Mini & #1 Gun**



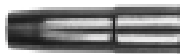
**No. 2 Gun**



**No. 2, 3, 4 Gun**



**No. 2, 3, 4 Gun**



| Part No.    | Bore Size Inches | Bore Size Metric | Insulator | Description  |
|-------------|------------------|------------------|-----------|--|
| VM21-50     | 1/2"             | 12.7 mm          | Self      | Standard<br>1/8" Recess  |
| VM21-62     | 5/8"             | 15.9 mm          | Self      |  |
| VM22-50     | 1/2"             | 12.7 mm          | VM32      | Adjustable Standard for No. 2 Gun<br>3/32" Projection, 1/4" Recess, use with VM52 Gas Diffuser   |
| VM22-62     | 5/8"             | 15.9 mm          | VM32      |  |
| VM22-37-SS  | 3/8"             | 9.5 mm           | VM32      | Optional, Short-Stop<br>1/4" to 1/16" Recess, no projection, use with VM52 Gas Diffuser  |
| VM22-50-SS  | 1/2"             | 12.7 mm          | VM32      |  |
| VM22-62-SS  | 5/8"             | 15.9 mm          | VM32      |  |
| VM22T-37-SS | 3/8"             | 9.5 mm           | VM32      | Optional, Tapered-use with tapered tips only and VM52 Gas Diffuser   |
| VM23-37     | 3/8"             | 9.5 mm           | Self      | Standard for No. 3, Optional for No. 2 and No. 4 Gun<br>1/8" to 5/32" Recess<br>For No. 2 Gun, use with VM52FN Diffuser                            |
| VM23-50     | 1/2"             | 12.7 mm          | Self      |  |
| VM23-62     | 5/8"             | 15.9 mm          | Self      |  |
| VM23-75     | 3/4"             | 19.1 mm          | Self      |  |
| VM23-50-F   | 1/2"             | 12.7 mm          | Self      | Optional for No. 2, 3, and 4 Gun<br>Flush to 1/16" Projection<br>For No. 2 Gun<br>Use with VM52FN Gas Diffuser                                     |
| VM23-62-F   | 5/8"             | 15.9 mm          | Self      |  |
| VM23T-37    | 3/8"             | 9.5 mm           | Self      | Optional, Tapered, No. 2, 3, and 4 Gun<br>1/8" Recess. For No. 2 Gun, use with VM52FN Gas Diffuser   |
| VM24A-50    | 1/2"             | 12.7 mm          | VM34A     | Standard for No. 4, Optional for No. 2 and No. 3 Gun<br>Adjustable<br>3/16" Projection, 1/4" Recess<br>For No. 2 Gun, use with VM52FN Gas Diffuser |
| VM24A-62    | 5/8"             | 15.9 mm          | VM34A     |  |
| VM24A-75    | 3/4"             | 19.1 mm          | VM34A     |  |
| VM24A-50-SS | 1/2"             | 12.7 mm          | VM34A     | Optional, Short-Stop for No. 2, 3 and 4 Gun<br>1/4" to 1/16" Recess, No Projection<br>for No. 2 Gun use with VM52FN Gas Diffuser                   |
| VM24A-62-SS | 5/8"             | 15.9 mm          | VM34A     |  |
| VM24CT-37-S | 3/8"             | 9.5 mm           | VM34CT    | Optional, Coarse Thread for No. 2, 3 and 4 Gun<br>5/32" Recess<br>for No. 2 Gun, use with VM52FN Gas Diffuser                                      |
| VM24CT-50-S | 1/2"             | 12.7 mm          | VM34CT    |  |
| VM24CT-62-S | 5/8"             | 15.9 mm          | VM34CT    |  |
| VM24CT-75-S | 3/4"             | 19.1 mm          | VM34CT    |  |
| VM24CT-50-F | 1/2"             | 12.7 mm          | VM34CT    | Optional, Coarse Thread for No. 2, 3 and 4 Gun<br>1/16" Recess<br>for No. 2 Gun, use with VM52FN Gas Diffuser                                      |
| VM24CT-62-F | 5/8"             | 15.9 mm          | VM34CT    |  |

### Carbons Arc Gouging Electrodes

- Designed specifically for the air carbon arc metal removal process
- Highly resistant to breakage, heat and oxidation
- Excellent for fast-cutting of carbon and ductile irons, aluminum, copper and other high strength and high temperature alloys
- Broad range of cutting applications, such as machining grooves for weld-joint preparation, removing hard surface metal to facilitate repair, cutting non-ferrous and other hard-to-cut metals used in industries such as metal fabrication, foundries, shipbuilding, construction, machine shops, transportation, salvage yards, general maintenance, etc.



- Superior Metal Removal Rate
- Clean Cuts
- Cooler Operation
- Uniform Diameter
- Excellent Arc Stability

### DC Copperclad Electrodes

| Part No.    | Item/Size   |               | Electrical Requirement |         |
|-------------|-------------|---------------|------------------------|---------|
|             |             |               | Min Amp                | Max Amp |
| 22-023-003X | 1/8" x 12"  | (3 x 300 mm)  | 60                     | 90      |
| 22-983-003X | 5/32" x 12" | (4 x 300 mm)  | 90                     | 150     |
| 22-033-003X | 3/16" x 12" | (5 x 300 mm)  | 200                    | 250     |
| 22-043-003X | 1/4" x 12"  | (6 x 300 mm)  | 300                    | 400     |
| 22-053-003X | 5/16" x 12" | (8 x 300 mm)  | 350                    | 450     |
| 22-063-003X | 3/8" x 12"  | (10 x 300 mm) | 450                    | 600     |

### Arc Gouging Torches



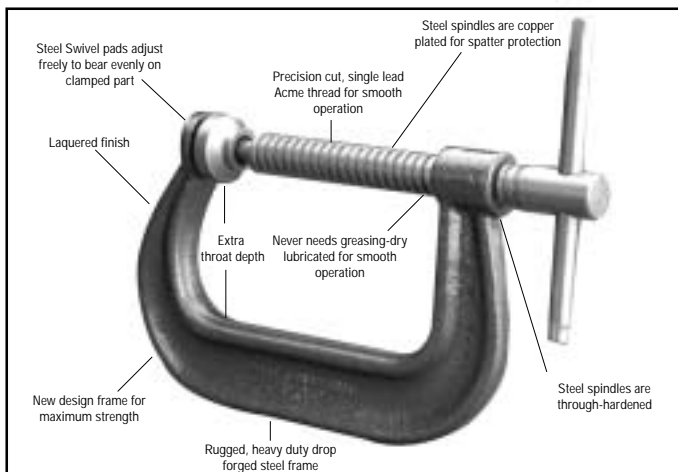
#### 61-062-016X

Model H-3 is a general purpose Best Welds torch which will groove, bevel, cut, gouge, pierce or flush away any kind of metal. The Best Welds torch saves time, costs less to use and gives a better finished job than older methods such as grinding, chipping, etc.



#### 61-064-009X

The K3 is a medium-duty torch. This torch is built for repair and maintenance jobs in areas such as mining, construction and all types metal fabrication.



### C-Clamps

| Part No. | UPC No.<br>0 27719 | Capacity         | Throat Depth | Proof Test (lbs) |
|----------|--------------------|------------------|--------------|------------------|
| 402P     | 00136 4            | 0" Thru 2-1/8"   | 2-5/8"       | 3500             |
| 404P     | 00141 8            | 0" Thru 4-7/16"  | 3-1/4"       | 6200             |
| 406P     | 00146 3            | 0" Thru 6-1/16"  | 4-1/8"       | 6900             |
| 408P     | 00151 7            | 0" Thru 8-3/16"  | 5"           | 6600             |
| 410P     | 00156 2            | 2" Thru 10-1/8"  | 6"           | 8000             |
| 412P     | 00161 6            | 2" Thru 12-3/16" | 6-5/16"      | 9300             |

### Chipping Hammer & Tank Wrenches



Part No. 000H



Part No. 0250



#### Part No. 1013

Precise Openings for firm hold

3/8" Socket for Acetylene Valves

All wrenches come in high quality, black gloss finish, and are individually polybagged

| Part No. | UPC No.<br>0 27719 | Type  | Socket Size | Carton Pack |
|----------|--------------------|---|-------------|-------------|
| 1013     | 00266 8            | Ten Way Wrench (3/16"- 1-1/8") with 3/8" Socket | 3/8"        | 10          |
| 0250     | 00271 2            | "T" Handle Wrench for Linde® Acetylene Valves   | 9/32"       | 10          |
| 000H     | 01006 9            | Hardened Cone & Chisel head with coil handle    |             | 10          |

**Cable Cover / Rap-Around / Valu-Mig Guns**



**MIG-TIG Cable Cover**

- Abrasion resistant woven material
- Non-conductive zipper with overlap flap to protect it from weld spatter
- New Enter-Tube™ design innovation saves time by allowing the cover to be installed without disconnecting the torch from the power source
- “Snug Straps” to secure both ends on torch
- Ultraviolet light resistant
- Acid/chemical resistant
- Flame & tear resistant

| Part No. | Description | Width | Length |
|----------|-------------|-------|--------|
| CC310B   | TIG 10'     | 3"    | 10'    |
| CC323B   | TIG 23'     | 3"    | 23'    |
| CC410B   | MIG 10'     | 4"    | 10'    |
| CC423B   | MIG 23'     | 4"    | 23'    |



**Welders & Pipe Fitters “Rap-Around”**

- Double ruled so both the top and bottom surfaces can be used for layouts - IT IS NEVER UPSIDE-DOWN!
- Packaged in its own clear plastic tube to protect it between uses
- Packaged 12 to a case

| Stock No. | Size        | Description          | Pipe Size      |
|-----------|-------------|----------------------|----------------|
| RA150     | small       | 2-1/2" W x 2' L      | 1" to 3" pipe  |
| RA160     | medium      | 4" W x 4' L*         | 3" to 6" pipe  |
| RA170     | large       | 4" W x 6' L*         | 3" to 10" pipe |
| RA177     | x-large     | 4" W x 7' L*         | 6" to 14" pipe |
| RA179     | xx-large    | 4" W x 9' L*         | 8" to 18" pipe |
| RA184     | Special "4" | 4" W, length desired |                |
| RA187     | Speical "7" | 7" W, length desired |                |

\* 36" area imprinted with Lay-Out information



**Valu-Rod Oven**

Operates from any 115 volt, AC/DC source. Is equipped with rod lifter, pilot light and has 1" high false bottom to prevent moisture damage to electric connections. Oven temperature not controlled by thermostat, averages 275 F.

- 10 lb. capacity
- 275 F average temperature range
- Weighs 14 lbs.
- Tube 100 W element with side placement
- 50/60 Hz frequency
- Single Phase

Part No. VO-10B



**Valu-Tig Torches & Accessories**

**TIG Line in Silicone Rubber**

| 125 AMP Air Cooled Flex (SR) |  |
|------------------------------|--|
| Part No.                     | Description  |
| VTR-9FV                      | Flex Torch w/valve, 125 AMP Air Cooled                                       |
| VTR-9FV-12-R                 | Torch Package: Torch body, handle, med. back cap, 1 pc. 12-1/2' rubber cable |
| VTR-9FV-25-R                 | Torch Package: Torch body, handle, med. back cap, 1 pc. 25' rubber cable     |

| 150 AMP Air Cooled Flex (SR) |   |
|------------------------------|---|
| Part No.                     | Description   |
| VTR-17FV                     | Flex torch w/valve, 150 AMP air cooled                                      |
| VTR-17FV-12-R                | Torch Package: Torch body, handle, long back cap, 1 pc 12-1/2' rubber cable |
| VTR-17FV-25-R                | Torch Package: Torch body, handle, long back cap, 1 pc 25' rubber cable     |

| 200 AMP Air Cooled Flex (SR) |  |
|------------------------------|--|
| Part No.                     | Description  |
| VTR-26FV                     | Flex Torch w/valve 200 AMP Air cooled  |
| VTR-26FV-12-R                | Torch Package: Torch body, handle, long back cap, 1 pc. 12-1/2' rubber cable |
| VTR-26FV-25-R                | Torch Package: Torch body, handle, long back cap, 1 pc. 25' rubber cable     |

| 125 AMP Air Cooled (SR) |   |
|-------------------------|---|
| Part No.                | Description   |
| VTR-9                   | Torch Body, 125 AMP Air cooled silicone rubber                              |
| VTR-9-12-R              | Torch Package: Torch Body, handle med. back cap, 1 pc. 12-1/2' rubber cable |
| VTR-9-25-R              | Torch Package:Torch Body, handle med. back cap, 1 pc. 25' rubber cable      |
| VTR-9V                  | Torch w/valve, 125 AMP air cooled silicone rubber                           |
| VTR-9V-12-R             | Torch Package: Torch Body, handle med. back cap, 1 pc. 12-1/2' rubber cable |
| VTR-9V-25-R             | Torch Package: Torch Body, handle med. back cap, 1 pc. 25' rubber cable     |



| 150 AMP Air Cooled (SR) |  |
|-------------------------|--|
| Part No.                | Description  |
| VTR-17                  | Torch, 150 AMP Air Cooled Silicone Rubber                                    |
| VTR-17-12-R             | Torch Package: Torch body, handle, long back cap, 1 pc. 12-1/2' rubber cable |
| VTR-17-25-R             | Torch Package: Torch body, handle, long back cap, 1 pc. 25' rubber cable     |
| VTR-17V                 | Torch w/valve, 150 AMP air cooled silicon rubber                             |
| VTR-17V-12-2            | Torch Package: Torch body, handle, long back cap, 2 pc 12-1/2' braided cable |
| VTR-17V-12-R            | Torch Package: Torch body, handle, long back cap, 1 pc 12-1/2' rubber cable  |
| VTR-17V-25-2            | Torch Package: Torch body, handle, long back cap, 2 pc. 25' braided cable    |
| VTR-17V-25-R            | Torch Package: Torch body, handle, long back cap, 1 pc. 25' rubber cable     |

| 200 AMP Air Cooled (SR) |  |
|-------------------------|--|
| Part No.                | Description  |
| VTR-26                  | Torch 200 AMP Air cooled silicone rubber                                     |
| VTR-26-12-R             | Torch Package: Torch body, handle, long back cap, 1 pc. 12-1/2' rubber cable |
| VTR-26-25-R             | Torch Package: Torch body, handle, long back cap, 1 pc. 25' rubber cable     |
| VTR-26V                 | Torch w/ valve, 200 AMP air cooled silicone rubber                           |
| VTR-26V-12-R            | Torch Package: Torch body, handle, long back cap, 1 pc. 12-1/2' rubber cable |
| VTR-26V-25-R            | Torch Package: Torch body, handle, long back cap, 1 pc. 25' rubber cable     |

| 250 AMP Water Cooled (SR) |  |
|---------------------------|--|
| Part No.                  | Description  |
| VTR-20                    | Torch, 250 AMP Water cooled silicone rubber                                    |
| VTR-20-12                 | Torch Package: Torch body, handle, long back cap, 3 pc. 12-1/2' vinyl pc. assy |
| VTR-20-25                 | Torch Package: Torch body, handle, long back cap, 3 pc. 25' vinyl pc. assy     |

| 350 AMP Water Cooled (SR) |   |
|---------------------------|---|
| Part No.                  | Description   |
| VTR-18                    | Torch, 350 AMP Water cooled silicone rubber                                   |
| VTR-18-12                 | Torch Package: Torch body, handle, long back cap, 3 pc. 12-1/2' vinyl pc assy |
| VTR-18-25                 | Torch Package: Torch body, handle, long back cap, 3 pc. 25' vinyl pc assy     |



### Valu Coolers



VC2500SS

- Best Welds Valu Water Coolers are ideal for MIG, TIG, Plasma, resistance, and Electro-Slag type welding.
- Best Welds Valu Water Coolers feature an all stainless steel tank, copper radiator coils, and a reinforced hose.
- Best Welds Valu Water Coolers have easy-to-read water indicators, quick change pumps and filters.
- Available in two compact styles with rigid motor mount to minimize damage and vibration.



VC3500SS

| Model:              | VC2500SS   | VC3500SS   |
|---------------------|--|--|
| Dimensions:         | 17"L x 11" W x 14"H<br>(43.2 cm x 27.9 cm x 35.6 cm)                       | 21-1/4"L x 13-1/8"W x 16-3/4"H<br>(54.0 cm x 33.3 cm x 42.5 cm)            |
| Reservoir:          | 2-gallon capacity, stainless steel   | 3-gallon capacity, stainless steel   |
| Pump Capacity:      | 100 psi max.<br>1.5 gpm (5.68 lpm) @ 50 psi<br>1.8 gpm (6.81 lpm) @ 60 psi | 100 psi max.<br>1.5 gpm (5.68 lpm) @ 50 psi<br>1.8 gpm (6.81 lpm) @ 60 psi |
| Heat Exchanger:     | High efficiency, copper core, rustproof                                    | High efficiency, copper core, rustproof                                    |
| Motor Voltage:      | 115VAC single phase<br>60 Hz   | 115VAC single phase<br>60 Hz   |
| Amperage:           | 6.8  | 6.8  |
| Water Connections:  | 1/4" NPT supplied w/ 5/8-18" UNC LH thread fitting                         | 1/4" NPT supplied w/ 5/8-18" UNC LH thread fitting                         |
| Net Weight:         | 29.3 lbs. (13.3 kg)  | 43 lbs. (19.5 kg)  |
| App Shipping Weight | 34.3 lbs. (15.5 kg)  | 46 lbs. (20.9 kg)  |

### Cooler Fluids



Specially formulated for use in radiator circulator and re-circulator systems. Recommended for all Plasma, MIG, TIG resistance welding systems and general industrial applications. Extends warranty

For best results always use special coolant fluid in place of ordinary tap water.

**Red Coolant**-For plasma cutting and welding applications.

**Blue Coolant**-For MIG, TIG, resistance welding, and general industrial applications.

**Green Coolant**- For superior temperature applications.

| Part No. | Description               | UM               |
|----------|---------------------------|------------------|
| 16-25501 | Blue Coolant 19°F/-7°C    | 1GL/3.785 liters |
| 16-25502 | Red Coolant 6°F/-14°C     | 1GL/3.785 liters |
| 16-25503 | Green Coolant -60°F/-52°C | 1GL/3.785 liters |

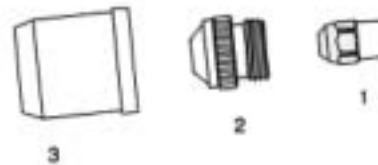
**Plasma**

**Replacement Parts Suitable for: ESAB/L-TEC PT-17/17A**

PCM-50, PCM-70, PCM-100

| Item | Part No. | Ref. No. | Description       | Std. Qty. |
|------|----------|----------|-------------------|-----------|
| 1    | CS19918  | 19918    | Electrode         | 1         |
| 2    | CS19915  | 19915    | Nozzle, 50A       | 1         |
|      | CS19916  | 19916    | Nozzle, 60A       | 1         |
|      | CS19917  | 19917    | Nozzle, 70A       | 1         |
|      | CS20056  | 20056    | Nozzle, 150A      | 1         |
| 3    | CS19124  | 19124    | Heat Shield       | 1         |
| N/S  | CS20053* | 20053    | Electrode Adapter | 1         |
| N/S  | CS19114* | 19114    | Baffle Tube       | 1         |

\*= OEM

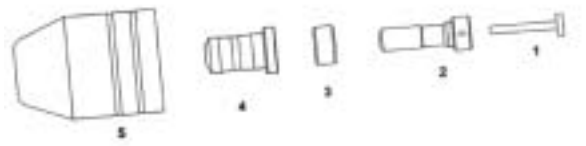


**Replacement Parts Suitable for: ESAB/L-TEC PT-27**

PCM-750i, PCM-875, PCM-1000i

| Item | Part No. | Ref. No. | Description    | Std. Qty. |
|------|----------|----------|----------------|-----------|
| 1    | CS21619  | 21619    | Valve Pin      | 1         |
| 2    | CS33366  | 33366    | Electrode      | 1         |
| 3    | CS33367  | 33367    | Swirl Baffle   | 1         |
| 4    | CS33368  | 33368    | Nozzle, 30A    | 1         |
|      | CS33369  | 33369    | Nozzle, 50A    | 1         |
|      | CS33418  | 33418    | Nozzle, 80A    | 1         |
| 5    | CS21616  | 21616    | HeatShield     | 1         |
| 5    | CS21615* | 21615    | Electrode Seat | 1         |

\*= OEM



**Replacement Parts Suitable for: ESAB/L-TEC PT-31/PT-31XL**

PCM-Smi, VPi, 32i, 34i, 52i, 54i, 500i, 625i

| Item | Part No. | Ref. No. | Description            | Std. Qty. |
|------|----------|----------|------------------------|-----------|
| 1    | CS20862  | 20862    | Extended Electrode, XT | 1         |
| 2    | CS20463  | 20463    | Swirl Baffle           | 1         |
| 3    | CS20860  | 20860    | Extended Tip, XT, 30A  | 1         |
|      | CS21008  | 21008    | Extended Tip, XT, 40A  | 1         |
|      | CS20861  | 20861    | Extended Tip, XT, 50A  | 1         |
| 4    | CS18204  | 18204    | HeatShield             | 1         |
| N/S  | CS19679* | 19679    | Seat                   | 1         |
| N/S  | CS20324* | 20324    | Plunger                | 1         |

\*= OEM

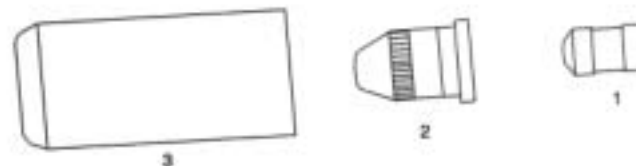


**Replacement Parts Suitable for: ESAB/L-TEC PT-20AM**

PCM-875, PCM-150, PCM-1000i

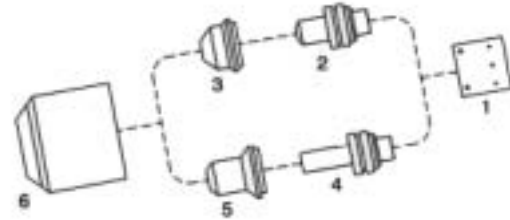
| Item | Part No. | Ref. No. | Description                                | Std. Qty. |
|------|----------|----------|--|-----------|
| 1    | CS21150  | 21150    | Electrode                                  | 1         |
| 2    | CS21330  | 21330    | Nozzle, 50A                                | 1         |
|      | CS21329  | 21329    | Nozzle, 70A                                | 1         |
|      | CS21328  | 21328    | Nozzle, 100A                               | 1         |
| 3    | CS21326  | 21326    | HeatShield                                 | 1         |
| N/S  | CS21372* | 21372    | Electrode Seat                             | 1         |
| N/S  | CS21373* | 21373    | Electrode Insulator                        | 1         |
| N/S  | CS21374* | 21374    | Baffle Tube                                | 1         |
| N/S  | CS21332* | 21332    | Electrode Holder Assembly includes CS21374 | 1         |

\*= OEM



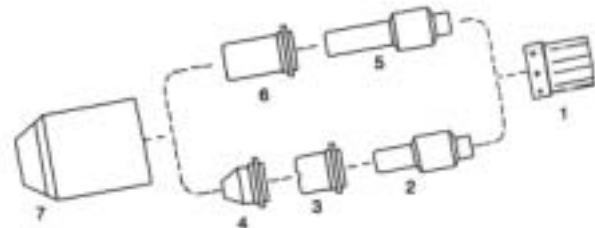
**Replacement Parts Suitable for: HYPERTHERM PAC110  
MAX®20, Powermax®350**

| Item | Part No. | Ref. No. | Description         | Std. Qty. |
|------|----------|----------|---------------------|-----------|
| 1    | CS020239 | 020239   | Swirl Ring          | 1         |
| 2    | CS020220 | 020220   | Electrode           | 1         |
| 3    | CS020299 | 020299   | Nozzle, 20A         | 1         |
|      | CS120504 | 120504   | Nozzle, 25A         | 1         |
| 4    | CS020382 | 020382   | Electrode, Extended | 1         |
| 5    | CS020381 | 020381   | Extended Tip, 20A   | 1         |
| 6    | CS020218 | 020218   | Retaining Cap       | 1         |



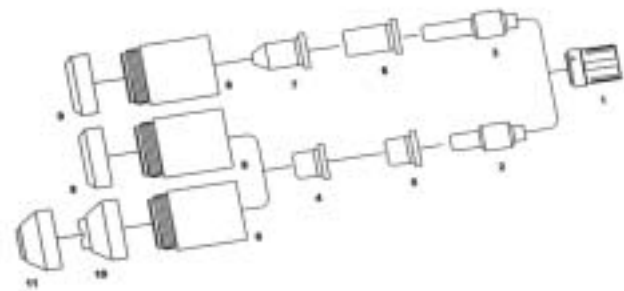
**Replacement Parts Suitable for: HYPERTHERM PAC120  
MAX®40CS, MAX®42, MAX®43**

| Item | Part No. | Ref. No. | Description                       | Std. Qty. |
|------|----------|----------|-----------------------------------|-----------|
| 1    | CS020361 | 020361   | Swirl Ring                        | 1         |
| 2    | CS020351 | 020351   | Electrode, Air                    | 1         |
|      | CS120573 | 120573   | Electrode, N2 (replaces 020480)   | 1         |
| 3    | CS020350 | 020350   | Nozzle, 40A                       | 1         |
| 4    | CS020542 | 020542   | Nozzle, Pipe Saddle               | 1         |
| 5    | CS020547 | 020547   | Extended Electrode                | 1         |
| 6    | CS020546 | 020546   | Nozzle, Extended                  | 1         |
|      | CS120281 | 120281   | Nozzle, Gouging (replaces 020539) | 1         |
| 7    | CS020930 | 020930   | Retaining Cap                     | 1         |



**Replacement Parts Suitable for: HYPERTHERM PAC121  
Powermax®800**

| Item | Part No.  | Ref. No. | Description                    | Std. Qty. |
|------|-----------|----------|--------------------------------|-----------|
| 1    | CS020361  | 020361   | Swirl Ring                     | 1         |
| 2    | CS020351  | 020351   | Electrode                      | 1         |
|      | CS120573* | 120573   | Electrode                      | 1         |
| 3    | CS020547  | 020547   | Electrode, Extended            | 1         |
|      | CS120574* | 120574   | Electrode, Extended            | 1         |
| 4    | CS120438  | 120438   | Nozzle, Shielded, 40A          | 1         |
|      | CS120282  | 120282   | Nozzle, Shielded, 50A          | 1         |
| 5    | CS020395  | 020395   | Nozzle, Non-shielded           | 1         |
| 6    | CS120304  | 120304   | Nozzle, Extended, Non-Shielded | 1         |
| 7    | CS120305  | 120305   | Nozzle, Extended, Pipe Saddle  | 1         |
| 8    | CS120301  | 120301   | Retaining Cap                  | 1         |
| 9    | CS120303  | 120303   | Deflector, Non-Shielded        | 1         |
| 10   | CS120601* | 120601   | Shield, Hand (replaces 120283) | 1         |
| 11   | CS120602* | 120602   | Shield, Machine                | 1         |



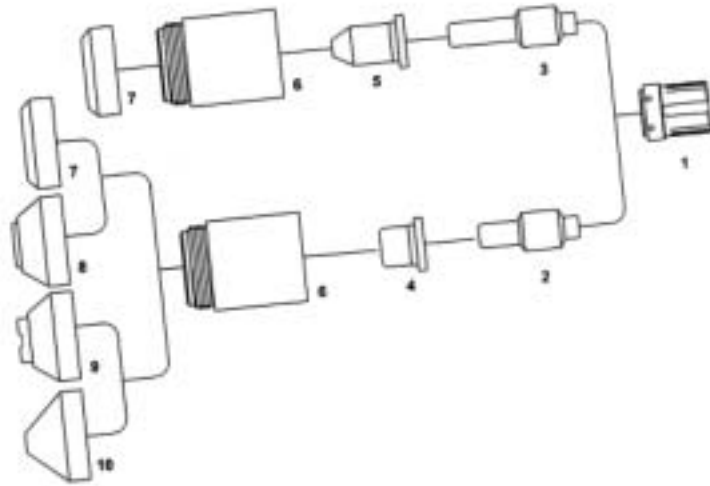
\*= OEM

**Plasma**

**Replacement Parts Suitable for: HYPERTHERM PAC125  
Powermax®900**

| Item | Part No.  | Ref. No. | Description              | Std. Qty. |
|------|-----------|----------|--------------------------|-----------|
| 1    | CS120576* | 120576   | Swirl Ring               | 1         |
| 2    | CS120573* | 120573   | Electrode                | 5         |
| 3    | CS120574* | 120574   | Electrode, Extended      | 5         |
| 4    | CS120577* | 120577   | Nozzle, Shielded, 55A    | 5         |
| 5    | CS120578* | 120578   | Nozzle, Pipe Saddle, 55A | 5         |
|      | CS120606* | 120606   | Nozzle, Pipe Saddle, 35A | 5         |
|      | CS120607  | 120607   | Nozzle, Gouging          | 1         |
| 6    | CS120600* | 120600   | Retaining Cap            | 1         |
| 7    | CS120303  | 120303   | Deflector, Non-Shielded  | 1         |
| 8    | CS120601* | 120601   | Shield, Hand             | 1         |
| 9    | CS120602* | 120692   | Shield, Machine          | 1         |
| 10   | CS120608  | 120608   | Shield, Gouging          | 1         |

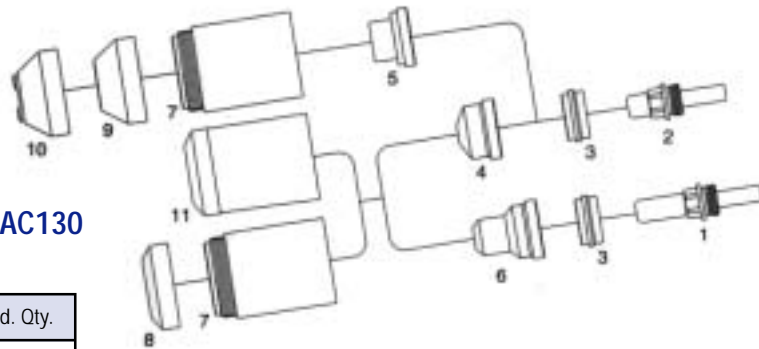
\* = OEM



**Replacement Parts Suitable for: HYPERTHERM PAC130  
MAX®70, MAX®80, MAX®100**

| Item | Part No.  | Ref. No. | Description                      | Std. Qty. |
|------|-----------|----------|----------------------------------|-----------|
| 1    | CS020191  | 020191   | Electrode, Air                   | 1         |
|      | CS120433* | 120433   | Electrode, Air                   | 5         |
|      | CS020193  | 020193   | Electrode, N2                    | 5         |
| 2    | CS020564  | 020564   | Electrode, Extended, Air, 10/80A | 1         |
|      | CS020886  | 020886   | Electrode, Extended, N2, 10/80A  | 1         |
|      | CS120444* | 120444   | Electrode, Extended, Air, 70/80A | 5         |
|      | CS020744  | 020744   | Electrode, Gouging, Air, 70/100A | 5         |
| 3    | CS020194  | 020194   | Swirl Ring                       | 1         |
| 4    | CS020203  | 020203   | Nozzle, Non-Shielded, 40A        | 1         |
|      | CS020396  | 020396   | Nozzle, Shielded, 40A            | 1         |
|      | CS020345  | 020345   | Nozzle, Non-Shielded, 70/80A     | 1         |
|      | CS020195  | 020195   | Nozzle, Non-Shielded, 100A       | 1         |
| 5    | CS020397  | 020397   | Nozzle, Shielded 70/80A          | 1         |
|      | CS020337  | 020337   | Nozzle, Shielded 100A            | 1         |
| 6    | CS020563  | 020563   | Nozzle, Extended                 | 1         |
|      | CS120459  | 120459   | Nozzle, Gouging, 100A            | 1         |
|      | CS020878  | 020878   | Nozzle, Gouging, 70A             | 1         |
| 7    | CS020336  | 020336   | Shield Cap                       | 1         |
| 8    | CS020333* | 020333   | Deflector                        | 1         |
| 9    | CS020335* | 020335   | Shield, Hand                     | 1         |
| 10   | CS020334* | 020334   | Shield, Machine                  | 1         |
|      | CS020490* | 020490   | Shield, Machine, 40A             | 1         |
| N/S  | CS020712  | 020712   | Shield, Gouging                  | 1         |
| 11   | CS020184  | 020184   | Retaining Cap, Std.              | 1         |

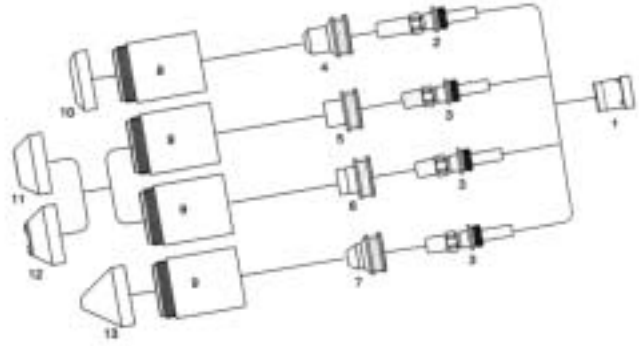
\* = OEM



**Replacement Parts Suitable for: HYPERTHERM PAC135  
Powermax®1100**

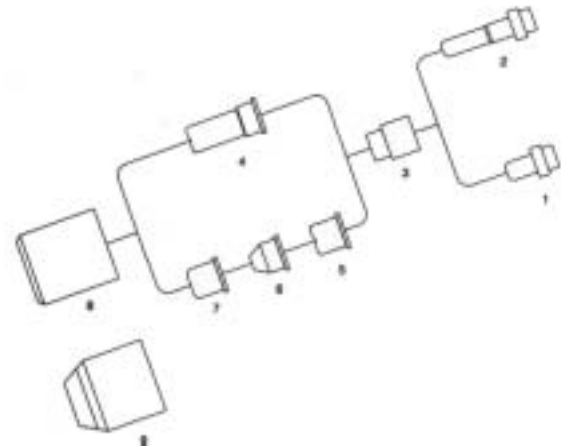
| Item | Part No.  | Ref. No. | Description                   | Std. Qty. |
|------|-----------|----------|-------------------------------|-----------|
| 1    | CS120474  | 120474   | Swirl Ring                    | 1         |
| 2    | CS120517* | 120517   | Electrode, Extended, Air, 80A | 5         |
| 3    | CS120473  | 120473   | Electrode, Air, 80A           | 5         |
| 4    | CS120518  | 120518   | Nozzle, Extended, 80A         | 5         |
| 5    | CS120476* | 120476   | Nozzle, Shielded, 80A         | 5         |
| 6    | CS120515* | 120515   | Nozzle, Shielded, 40A         | 5         |
| 7    | CS120509  | 120509   | Nozzle, Gouging, Air          | 5         |
| 8    | CS120483  | 120483   | Shield Cap, 80A               | 1         |
| 9    | CS120520  | 120520   | Shield Cap, 40A               | 1         |
| 10   | CS120519* | 120519   | Deflector                     | 1         |
| 11   | CS120516* | 120516   | Shield, Machine               | 1         |
| 12   | CS120475* | 120475   | Shield, Hand, 40/80A          | 1         |
| 13   | CS120510  | 120510   | Shield, Gouging               | 1         |

\*= OEM



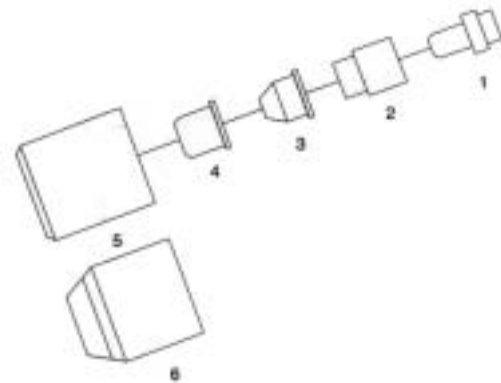
**Replacement Parts Suitable for: HYPERTHERM PAC140  
MAX®40**

| Item | Part No. | Ref. No. | Description               | Std. Qty. |
|------|----------|----------|---------------------------|-----------|
| 1    | CS020103 | 020103   | Electrode                 | 1         |
| 2    | CS020467 | 020467   | Electrode, Extended       | 1         |
|      | CS020167 | 020167   | Electrode, N2             | 5         |
| 3    | CS020101 | 020101   | Swirl Ring                | 1         |
| 4    | CS020466 | 020466   | Nozzle, Extended          | 1         |
| 5    | CS020115 | 020115   | Nozzle, Non-Shielded, 40A | 1         |
| 6    | CS020131 | 020131   | Nozzle, Pipe Saddle       | 1         |
|      | CS020197 | 020197   | Nozzle, Tapered, Hi-Vis   | 5         |
| 7    | CS020102 | 020102   | Nozzle, 40A               | 1         |
| 8    | CS020104 | 020104   | Retaining Cap             | 1         |
| 9    | CS020200 | 020200   | Retaining Cap, Hi-Vis     | 1         |



**Replacement Parts Suitable for: HYPERTHERM HT®40  
HT®40C**

| Item | Part No. | Ref. No. | Description           | Std. Qty. |
|------|----------|----------|-----------------------|-----------|
| 1    | CS020103 | 020103   | Electrode, Air        | 1         |
|      | CS020167 | 020167   | Electrode, N2         | 5         |
| 2    | CS020101 | 020101   | Swirl Ring            | 1         |
| 3    | CS020131 | 020131   | Nozzle, Pipe Saddle   | 1         |
| 4    | CS020102 | 020102   | Nozzle, 40A           | 1         |
| 5    | CS020104 | 020104   | Retaining Cap         | 1         |
| 6    | CS020200 | 020200   | Retaining Cap, Hi-Vis | 1         |

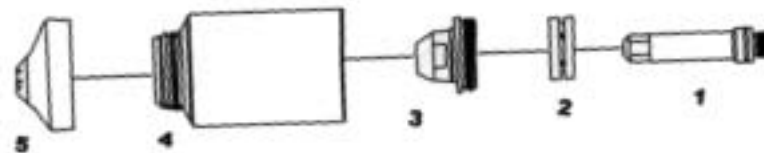
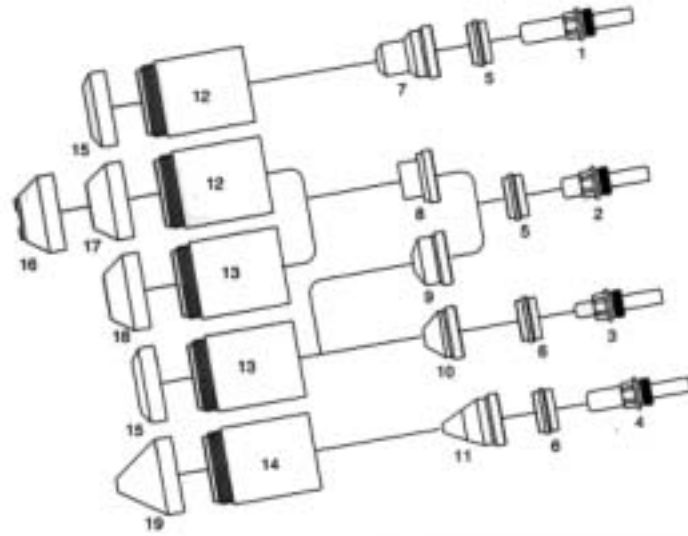


**Plasma**

**Replacement Parts Suitable for: HYPERTHERM PAC160  
MAX®100D**

| Item | Part No.  | Ref. No. | Description                    | Std. Qty. |
|------|-----------|----------|--------------------------------|-----------|
| 1    | CS020564  | 020564   | Electrode, Extended, Air, 100A | 1         |
|      | CS020887  | 020887   | Electrode, Extended, N2, 100A  | 5         |
|      | CS120444* | 120444   | Electrode, Extended, Air, 100A | 5         |
| 2    | CS020191  | 020191   | Electrode, Air                 | 1         |
|      | CS120433* | 120433   | Electrode, Air                 | 5         |
|      | CS020193  | 020193   | Electrode, N2                  | 5         |
| 3    | CS020951  | 020951   | Electrode, Air, 30/40A         | 5         |
| 4    | CS020744  | 020744   | Electrode, Gouging, Air        | 5         |
|      | CS020703  | 020703   | Electrode, Gouging, A/H2       | 5         |
| 5    | CS020706  | 020706   | Swirl Ring                     | 1         |
| 6    | CS020950  | 020950   | Swirl Ring, 30/40A             | 1         |
|      | CS020750  | 020750   | Swirl Ring, Gouging            | 1         |
| 7    | CS020754  | 020754   | Nozzle, Extended, 100A         | 5         |
| 8    | CS120336* | 120336   | Nozzle, Shielded, 60A          | 5         |
|      | CS020705* | 020705   | Nozzle, Shielded, 100A         | 5         |
| 9    | CS020922  | 020922   | Nozzle, Non-Shielded, 60A      | 5         |
| 10   | CS020921  | 020921   | Nozzle, Non-Shielded, 100A     | 5         |
| 11   | CS020745  | 020745   | Nozzle, Gouging, Air           | 5         |
|      | CS020704  | 020704   | Nozzle, Gouging, A/H2          | 5         |
| 12   | CS020846  | 020846   | Shield Cap, 100A               | 1         |
| 13   | CS020756  | 020756   | Shield Cap, 60A                | 1         |
| 14   | CS020699  | 020699   | Shield Cap, Gouging            | 1         |
| 15   | CS020333* | 020333   | Deflector                      | 1         |
| 16   | CS020335* | 020335   | Shield, Hand                   | 1         |
| 17   | CS020334* | 020334   | Shield, Machine                | 1         |
| 18   | CS020492  | 020492   | Shield, Machine, 60A           | 1         |
| 19   | CS020712  | 020712   | Shield, Gouging                | 1         |

\*= OEM



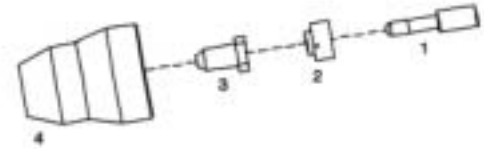
**Replacement Parts Suitable for: HYPERTHERM MAX®200  
MAX®200**

| Item | Part No.  | Ref. No. | Description  | Std. Qty. |
|------|-----------|----------|--|-----------|
| 1    | CS120667  | 120667   | Electrode, Air/O2 <small>(replaces 020414)</small> | 1         |
|      | CS020415  | 020415   | Electrode, N2                                      | 1         |
| 2    | CS020607* | 020607   | Swirl Ring, Air, N2, Ar/H, 100-200A                | 1         |
|      | CS020604* | 020604   | Swirl Ring, O2, 200A                               | 1         |
|      | CS120833* | 120833   | Swirl Ring, O2, 200A                               | 1         |
| 3    | CS020611  | 020611   | Nozzle, Air/N2/Ar-H2, 100A                         | 1         |
|      | CS020608  | 020608   | Nozzle, Air/N2/Ar-H2, 200A                         | 1         |
|      | CS020605  | 020605   | Nozzle, O2, 200A                                   | 1         |
| 4    | CS020423* | 020423   | Retaining Cap                                      | 1         |
| 5    | CS020424* | 020424   | Shield, Machine                                    | 1         |
|      | CS020446* | 020446   | Shield, Hand                                       | 1         |
|      | CS020566* | 020566   | Shield, O2, 200 Amps                               | 1         |

\*= OEM

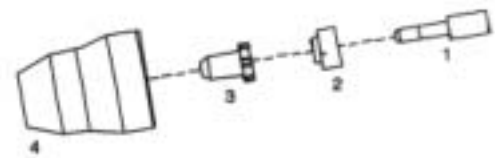
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-10  
Drag-Gun™, Cougar™**

| Item | Part No. | Ref. No. | Description     | Std. Qty. |
|------|----------|----------|-----------------|-----------|
| 1    | CS96006  | 9-6006   | Electrode       | 5         |
| 2    | CS96007  | 9-6007   | Gas Distributor | 1         |
| 3    | CS96099  | 9-6099   | Tip-Air         | 5         |
| 4    | CS96003  | 9-6003   | Shield Cup      | 1         |



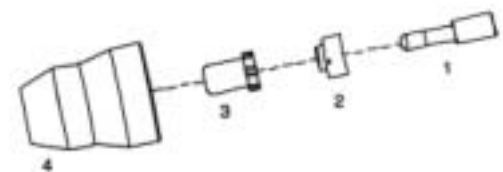
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-25  
EconoPak®, Pak Master®25**

| Item | Part No. | Ref. No. | Description     | Std. Qty. |
|------|----------|----------|-----------------|-----------|
| 1    | CS96006  | 9-6006   | Electrode       | 5         |
| 2    | CS96007  | 9-6007   | Gas Distributor | 1         |
| 3    | CS94476  | 9-4476   | Tip-Air         | 5         |
| 4    | CS96003  | 9-6003   | Shield Cup      | 1         |



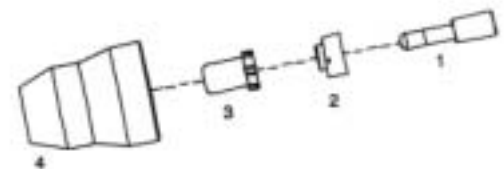
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-25/38  
Pak Master® 38XL, Drag-Gun™ 38**

| Item | Part No. | Ref. No. | Description     | Std. Qty. |
|------|----------|----------|-----------------|-----------|
| 1    | CS96506  | 9-6506   | Electrode       | 5         |
| 2    | CS96507  | 9-6507   | Gas Distributor | 1         |
| 3    | CS96501  | 9-6501   | Tip, Air        | 5         |
| 4    | CS96003  | 9-6003   | Shield Cup      | 1         |



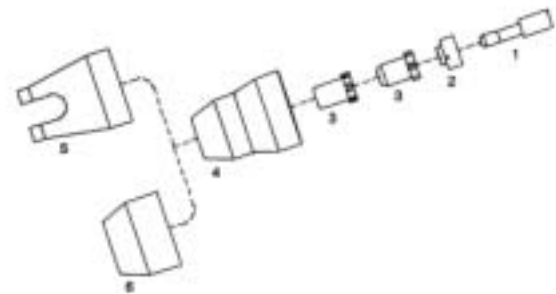
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-26  
EconoPak® 50**

| Item | Part No. | Ref. No. | Description     | Std. Qty. |
|------|----------|----------|-----------------|-----------|
| 1    | CS96506  | 9-6506   | Electrode       | 5         |
| 2    | CS96507  | 9-6507   | Gas Distributor | 1         |
| 3    | CS96501  | 9-6501   | Tip, Air        | 5         |
| 4    | CS96003  | 9-6003   | Shield Cup      | 1         |



**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-28  
PakMaster® 50XL**

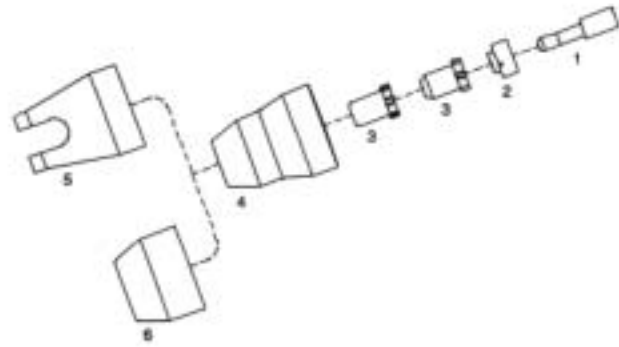
| Item | Part No. | Ref. No. | Description                              | Std. Qty. |
|------|----------|----------|--|-----------|
| 1    | CS96506  | CS96506  | Electrode                                | 5         |
| 2    | CS96507  | CS96507  | Gas Distributor                          | 1         |
| 3    | CS96500  | CS96500  | Tip, Standoff                            | 5         |
|      | CS96501  | CS96501  | Tip, Drag                                | 5         |
| 4    | CS96003  | CS96003  | Shield Cup, Std.                         | 1         |
| 5    | CS96004  | CS96004  | Shield Cup, Crown (requires CS96003)     | 1         |
| 6    | CS96503  | CS96503  | Shield Cup, Max. life (requires CS96003) | 1         |



**Plasma**

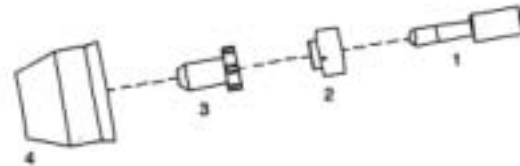
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-35  
PakMaster® 50, Stak-Pak**

| Item | Part No. | Ref. No. | Description                              | Std. Qty. |
|------|----------|----------|--|-----------|
| 1    | CS96506  | CS96506  | Electrode                                | 5         |
| 2    | CS96507  | CS96507  | Gas Distributor                          | 1         |
| 3    | CS96500  | CS96500  | Tip, Standoff                            | 5         |
|      | CS96501  | CS96501  | Tip, Drag                                | 5         |
| 4    | CS96003  | CS96003  | Shield Cup, Std.                         | 1         |
| 5    | CS96004  | CS96004  | Shield Cup, Crown (requires CS96003)     | 1         |
| 6    | CS96503  | CS96503  | Shield Cup, Max. life (requires CS96003) | 1         |



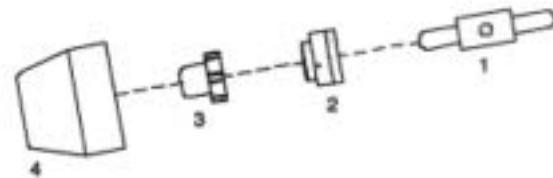
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-20  
DynaPak™ 110, Pak@2XT**

| Item | Part No. | Ref. No. | Description      | Std. Qty. |
|------|----------|----------|------------------|-----------|
| 1    | CS96006  | 9-6006   | Electrode        | 5         |
| 2    | CS83233  | 8-3233   | Gas Distributor  | 1         |
| 3    | CS83218  | 8-3218   | Tip              | 5         |
| 4    | CS83214  | 8-3214   | Shield Cup, Std. | 1         |
| N/S  | CS83228  | 8-3228   | Skinning Cap     | 1         |



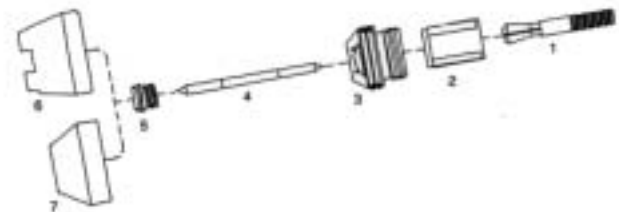
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-30  
Pak@3**

| Item | Part No. | Ref. No. | Description      | Std. Qty. |
|------|----------|----------|------------------|-----------|
| 1    | CS95503  | 9-5503   | Electrode        | 5         |
|      | CS95582  | 9-5582   | Electrode        | 5         |
| 2    | CS83233  | 8-3233   | Gas Distributor  | 1         |
| 3    | CS95501  | 9-5501   | Tip              | 5         |
|      | CS95581  | 9-5581   | Tip              | 5         |
| 4    | CS95500  | 9-5500   | Shield Cup, Std. | 1         |



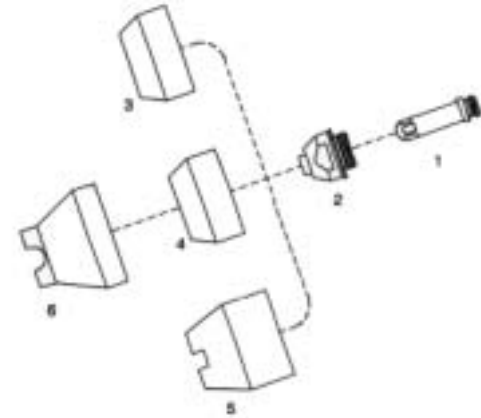
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH-50  
Pak@5**

| Item | Part No. | Ref. No. | Description              | Std. Qty. |
|------|----------|----------|--------------------------|-----------|
| 1    | CS85506  | 8-5506   | Collet                   | 1         |
| 2    | CS85510  | 8-5510   | Sleeve                   | 1         |
| 3    | CS85520  | 8-5520   | Liner (includes O-rings) | 1         |
| 4    | CS85508  | 8-5508   | Electrode                | 5         |
| 5    | CS85507  | 8-5507   | Tip                      | 5         |
| 6    | CS85519  | 8-5519   | Shield Cup, Crown        | 1         |
| 7    | CS85505  | 8-5505   | Shield Cup, Std.         | 1         |



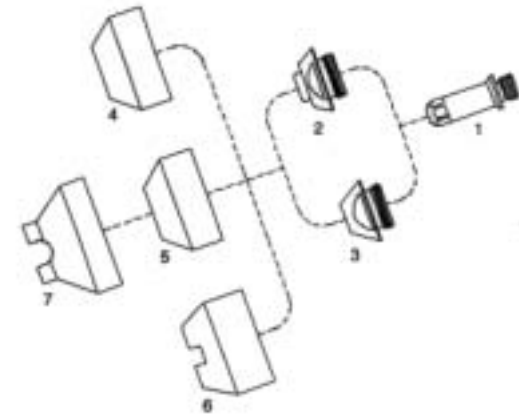
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-51**  
4Xi, 6Xi, Pak®3XR, 5XR, 6XR, 7XR, 625XR, 750XR, 5XT

| Item | Part No. | Ref. No. | Description                           | Std. Qty. |
|------|----------|----------|---------------------------------------|-----------|
| 1    | CS95633  | 9-5633   | Electrode                             | 5         |
|      | CS95720  | 9-5720   | Electrode                             | 5         |
| 2    | CS95718  | 9-5718   | Tip, Air, 10-40A                      | 5         |
|      | CS95631  | 9-5631   | Tip, Air, 10-60A                      | 5         |
|      | CS83321  | 8-3321   | Tip, Air, 65A                         | 5         |
|      | CS95724  | 9-5724   | Tip, Gouging, 0.078                   | 5         |
|      | CS95630  | 9-5630   | Shield Cup, Ceramic                   | 1         |
| 4    | CS82159  | 8-2159   | Shield Cup, Phenolic, Std.            | 1         |
| 5    | CS85526  | 8-5526   | Shield Cup, Ceramic, Crown            | 1         |
| 6    | CS95779  | 9-5779   | Shield Cup, Crown (fits over CS82159) | 1         |
| N/S  | CS82151  | 8-2151   | Shield Cup, Vespel                    | 1         |
| N/S  | CS82152  | 8-2152   | Shield Cup, Vespel, Lg.               | 1         |



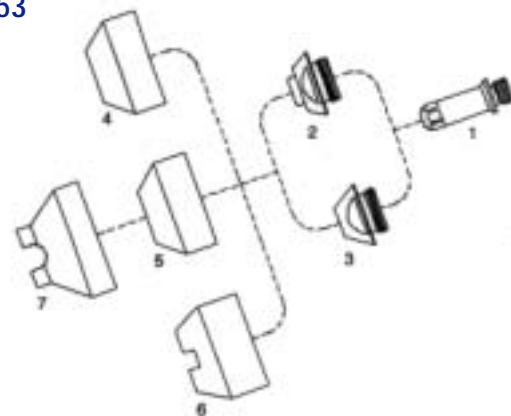
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-52**  
Pak®5XR\*, 6XR\*, 7XR\*, 8XR\*, 10XR\*, 625XR\*, 750XR\*, 1000XR, 1250XR  
(\* = Dual Gas)

| Item | Part No. | Ref. No. | Description                          | Std. Qty. |
|------|----------|----------|--------------------------------------|-----------|
| 1    | CS83331  | 8-3331   | Electrode, Air                       | 5         |
|      | CS95619  | 9-5619   | Electrode, Air, plated               | 5         |
|      | CS95711  | 9-5711   | Electrode, MultiGas                  | 5         |
| 2    | CS95702  | 9-5702   | Tip, Air, 35A                        | 5         |
|      | CS95618  | 9-5618   | Tip, Air, 45-55A                     | 5         |
|      | CS95707  | 9-5707   | Tip, Air, 60-70A                     | 5         |
|      | CS95782  | 9-5782   | Tip, Air, 80A                        | 5         |
|      | CS95708  | 9-5708   | Tip, Air, 105A                       | 5         |
|      | CS95713  | 9-5713   | Tip, Gouging, 105A                   | 5         |
| 3    | CS85129  | 8-5129   | Tip, Gouging                         | 5         |
|      | CS95709  | 9-5709   | Tip, Gouging, 70A                    | 5         |
|      | CS95710  | 9-5710   | Tip, Gouging, 105A                   | 5         |
|      | CS95713  | 9-5713   | Tip, Gouging, 105A                   | 5         |
| 4    | CS95617  | 9-5617   | Shield Cup, Ceramic, Std.            | 1         |
| 5    | CS95781  | 9-5781   | Shield Cup, Phenolic, Std.           | 1         |
| 6    | CS95694  | 9-5694   | Shield Cup, Ceramic, Crown           | 1         |
| 7    | CS95780  | 9-5780   | Shield Cup, Crown (fits over CS9581) | 1         |



**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-53**  
Pak Master® 100

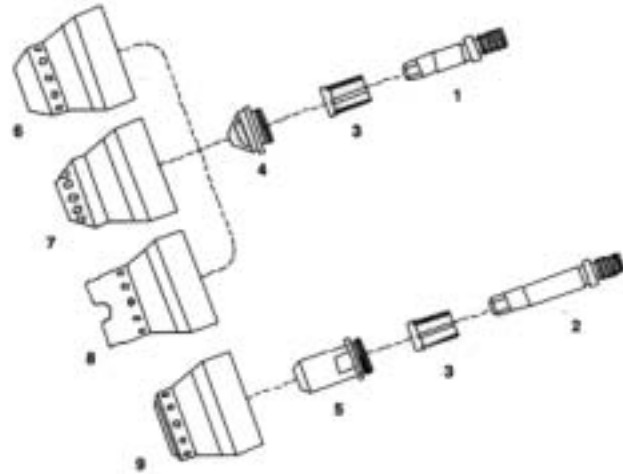
| Item | Part No. | Ref. No. | Description                           | Std. Qty. |
|------|----------|----------|---------------------------------------|-----------|
| 1    | CS95898  | 9-5898   | Electrode, Air                        | 5         |
| 2    | CS95897  | 9-5897   | Tip, Air, 70A                         | 5         |
| 3    | CS95709  | 9-5709   | Tip, Gouging, 70A                     | 5         |
| 4    | CS95617  | 9-5617   | Shield Cup, Ceramic, Std.             | 1         |
| 5    | CS95781  | 9-5781   | Shield Cup, Phenolic, Std.            | 1         |
| 6    | CS95694  | 9-5694   | Shield Cup, Ceramic, Crown            | 1         |
| 7    | CS95780  | 9-5780   | Shield Cup, Crown (fits over CS95781) | 1         |



**Plasma**

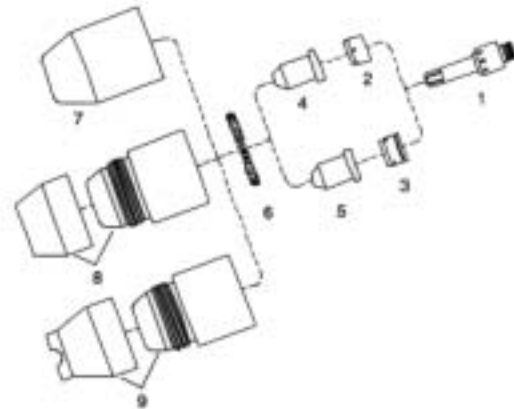
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-70  
Stak-Pak®**

| Item | Part No. | Ref. No. | Description                | Std. Qty. |
|------|----------|----------|----------------------------|-----------|
| 1    | CS96019  | 9-6019   | Electrode, Air/N2          | 5         |
|      | CS96021  | 9-6021   | Electrode, Ar/H2           | 5         |
| 2    | CS96107  | 9-6107   | Electrode, Gouging, Air/N2 | 5         |
|      | CS96108  | 9-6108   | Electrode, Gouging, Ar/H2  | 5         |
| 3    | CS96022  | 9-6022   | Gas Distributor            | 1         |
| 4    | CS96008  | 9-6008   | Tip, Air/N2, 35A           | 5         |
|      | CS96009  | 9-6009   | Tip, Air/N2, 70A           | 5         |
|      | CS96013  | 9-6013   | Tip, 70A, Ar/H2            | 5         |
| 5    | CS96014  | 9-6014   | Tip, Gouging               | 5         |
|      | CS96015  | 9-6015   | Tip, Gouging               | 5         |
|      | CS96109  | 9-6109   | Tip, Gouging               | 5         |
| 6    | CS96016  | 9-6016   | Shield Cup, Standoff, Std. | 1         |
| 7    | CS96024  | 9-6024   | Shield Cup, Standoff, Long | 1         |
| 8    | CS96017  | 9-6017   | Shield Cup, Crown          | 1         |
| 9    | CS96018  | 9-6018   | Shield Cup, Gouging        | 1         |



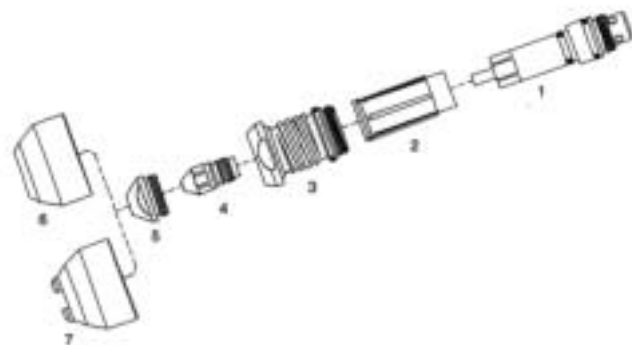
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-76, PCH/M-75, PCH/M-100XL  
EconoPak® 100, Pak Master® 75, 75XL, Pak® 625XR, Cutmaster™ 80XL, 100XL**

| Item | Part No. | Ref. No. | Description              | Std. Qty. |
|------|----------|----------|--------------------------|-----------|
| 1    | CS87502  | 8-7502   | Electrode                | 5         |
| 2    | CS87501  | 8-7501   | Gas Distributor, Cutting | 1         |
| 3    | CS87508  | 8-7508   | Gas Distributor, Gouging | 1         |
| 4    | CS87503  | 8-7503   | Tip, Air, 35A            | 5         |
|      | CS87504  | 8-7504   | Tip, Air, 50/60A         | 5         |
|      | CS87505  | 8-7505   | Tip, Air, 50/60A         | 5         |
| 5    | CS87506  | 8-7506   | Tip, Air, Gouging        | 5         |
| 6    | CS97501  | 9-7501   | Canted Coil Spring       | 1         |
| 7    | CS87500  | 8-7500   | Shield Cup, Std.         | 1         |
| 8    | CS96499  | 9-6499   | Shield Cup, Maximum Life | 1         |
| 9    | CS87507  | 8-7507   | Shield Cup, Crown        | 1         |



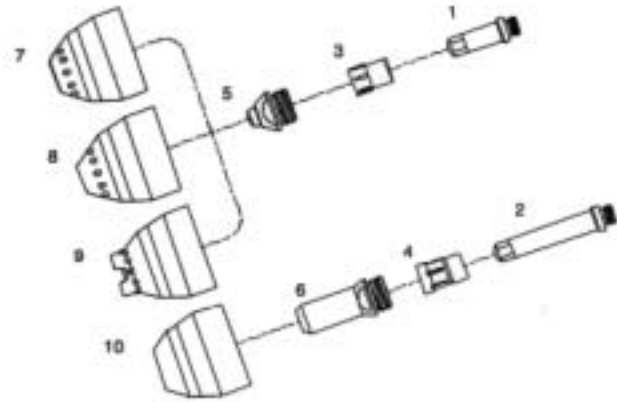
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-100  
Pak® 10XR**

| Item | Part No. | Ref. No. | Description         | Std. Qty. |
|------|----------|----------|---------------------|-----------|
| 1    | CS81108  | 8-1108   | Electrode Holder    | 1         |
| 2    | CS94339  | 9-4339   | Gas Distributor     | 1         |
| 3    | CS81106  | 8-1106   | Liner               | 1         |
| 4    | CS94340  | 9-4340   | Electrode           | 5         |
| 5    | CS94343  | 9-4343   | Tip, 35A            | 5         |
|      | CS94342  | 9-4342   | Tip, 70A            | 5         |
|      | CS94341  | 9-4341   | Tip, 105A           | 5         |
| 6    | CS81100  | 8-1100   | Shield Cup, Std.    | 1         |
|      | CS94345  | 9-4345   | Shield Cup, Machine | 1         |
|      | CS81101  | 8-1101   | Shield Cup, Crown   | 1         |



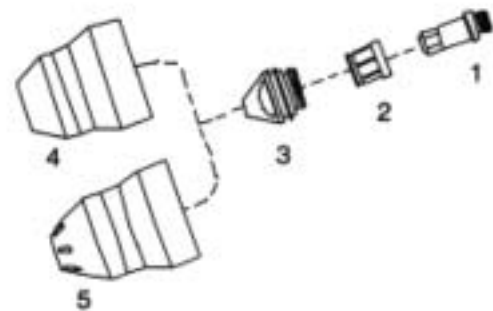
**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-140  
StakPak®**

| Item | Part No. | Ref. No. | Description                | Std. Qty. |
|------|----------|----------|----------------------------|-----------|
| 1    | CS96048  | 9-6048   | Electrode, Air/N2          | 5         |
|      | CS96050  | 9-6050   | Electrode, Ar/H2           | 5         |
| 2    | CS96110  | 9-6110   | Electrode, Gouging, Air/N2 | 5         |
|      | CS96111  | 9-6111   | Electrode, Gouging, Ar/H2  | 5         |
| 3    | CS96051  | 9-6051   | Gas Distributor, Cutting   | 1         |
| 4    | CS96112  | 9-6112   | Gas Distributor, Gouging   | 1         |
| 5    | CS96025  | 9-6025   | Tip, Air/N2, 35A           | 5         |
|      | CS96026  | 9-6026   | Tip, Air/N2, 70A           | 5         |
|      | CS96027  | 9-6027   | Tip, Air/N2, 105A          | 5         |
|      | CS96028  | 9-6028   | Tip, Air/N2, 140A          | 5         |
|      | CS96034  | 9-6034   | Tip, Ar/H2, 70A            | 5         |
|      | CS96035  | 9-6035   | Tip, Ar/H2, 105A           | 5         |
|      | CS96036  | 9-6036   | Tip, Ar/H2, 140A           | 5         |
| 6    | CS96037  | 9-6037   | Tip, Gouging .110          | 5         |
|      | CS96038  | 9-6038   | Tip, Gouging .125          | 5         |
|      | CS96039  | 9-6039   | Tip, Gouging .156          | 5         |
|      | CS96040  | 9-6040   | Tip, Gouging .171          | 5         |
| 7    | CS96045  | 9-6045   | Shield Cup, Std.           | 1         |
| 8    | CS96054  | 9-6054   | Shield Cup, Long           | 1         |
| 9    | CS96046  | 9-6046   | Shield Cup, Crown          | 1         |
| 10   | CS96047  | 9-6047   | Shield Cup, Gouging        | 1         |



**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-145  
StakPak®**

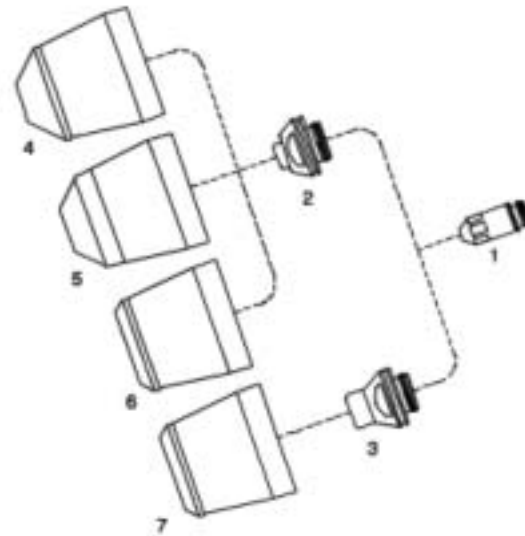
| Item | Part No. | Ref. No. | Description       | Std. Qty. |
|------|----------|----------|-------------------|-----------|
| 1    | CS96078  | 9-6078   | Electrode, Air    | 5         |
|      | CS96129  | 9-6129   | Electrode, N2     | 5         |
|      | CS96080  | 9-6080   | Electrode, Ar/H2  | 5         |
| 2    | CS96081  | 9-6081   | Gas Distributor   | 1         |
| 3    | CS96055  | 9-6055   | Tip, Air/N2, 35A  | 2         |
|      | CS96056  | 9-6056   | Tip, Air/N2, 70A  | 5         |
|      | CS96057  | 9-6057   | Tip, Air/N2, 105A | 5         |
|      | CS96058  | 9-6058   | Tip, Air/N2, 140A | 5         |
|      | CS96064  | 9-6064   | Tip, Ar/H2, 70A   | 5         |
|      | CS96065  | 9-6065   | Tip, Ar/H2, 105A  | 5         |
|      | CS96066  | 9-6066   | Tip, Ar/H2, 140A  | 5         |
| 4    | CS96075  | 9-6075   | Shield Cup, Std.  | 1         |
| 5    | CS96083  | 9-6083   | Shield Cup, Long  | 1         |



**Plasma**

**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-150  
Pak®15XC**

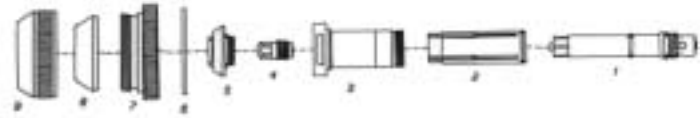
| Item | Part No. | Ref. No. | Description                    | Std. Qty. |
|------|----------|----------|--------------------------------|-----------|
| 1    | CS95749  | 9-5749   | Electrode, Air                 | 5         |
|      | CS95760  | 9-5760   | Electrode, O2                  | 5         |
|      | CS95754  | 9-5754   | Electrode, N2, Ar-H2           | 5         |
| 2    | CS95748  | 9-5748   | Tip, Air, 50A                  | 5         |
|      | CS95747  | 9-5747   | Tip, Air, 100A                 | 5         |
|      | CS95746  | 9-5746   | Tip, Air, 150A                 | 5         |
|      | CS95753  | 9-5753   | Tip, O2, 50A                   | 5         |
|      | CS95752  | 9-5752   | Tip, O2, 100A                  | 5         |
|      | CS95751  | 9-5751   | Tip, O2, 150A                  | 5         |
|      | CS95765  | 9-5765   | Tip, N2, 50A                   | 5         |
|      | CS95766  | 9-5766   | Tip, N2, 100A                  | 5         |
|      | CS95767  | 9-5767   | Tip, N2, 150A                  | 5         |
|      | CS95775  | 9-5775   | Tip, Ar/H2, 150A               | 5         |
| 3    | CS95756  | 9-5756   | Tip, Gouging, .078, 85A        | 5         |
|      | CS95755  | 9-5755   | Tip, Gouging, .120, 150A       | 5         |
| 4    | CS95750  | 9-5750   | Shield Cup, Ceramic Front      | 1         |
| 5    | CS95790  | 9-5790   | Shield Cup, Metal Front        | 1         |
| 6    | CS95801  | 9-5801   | Shield Cup, Copper (Tip Exp.)  | 1         |
|      | CS95758  | 9-5758   | Shield Cup, Ceramic (Tip Exp.) | 1         |
|      | CS95774  | 9-5774   | Shield Cup, Gouging            | 1         |



**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-4B(T)  
Pak®5 (Mech), Pak®10, Pak®10XR (Mech)**

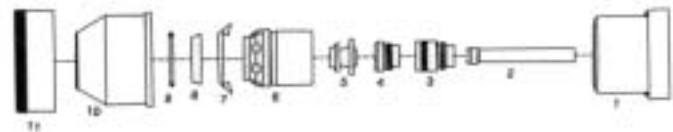
| Item | Part No. | Ref. No. | Description                   | Std. Qty. |
|------|----------|----------|-------------------------------|-----------|
| 1    | CS84158  | 8-4158   | Back Cap                      | 1         |
| 2    | CS84156  | 8-4156   | Collet, Std.                  | 1         |
| 3    | CS84197  | 8-4197   | Collet, 4BT                   | 1         |
| 4    | CS84182  | 8-4182   | Sleeve                        | 1         |
| 5    | CS84154  | 8-4154   | Liner                         | 1         |
| 6    | CS84073  | 8-4073   | Electrode                     | 5         |
| 7    | CS92421  | 9-2421   | Gas Distributor               | 5         |
|      | CS84153  | 8-4153   | Tip, Lo-Amp, .059             | 5         |
|      | CS84189  | 8-4189   | Tip, Lo-Amp, .030 (4BT/Pak 5) | 5         |
|      | CS84211  | 8-4211   | Tip, Std., .046 (4BT/Pak 5)   | 5         |
| 9    | CS84088  | 8-4088   | Shield Cup, Ceramic           | 1         |
| 10   | CS84213  | 8-4213   | Shield Cup, Crown             | 1         |





**Replacement Parts Suitable for: THERMAL DYNAMICS PCH/M-6B  
Pak®44, Pak®45**

| Item | Part No. | Ref. No. | Description             | Std. Qty. |
|------|----------|----------|-------------------------|-----------|
| 1    | CS86615  | 8-6615   | Electrode Holder        | 1         |
| 2    | CS86569  | 8-6569   | Gas Distributor         | 1         |
| 3    | CS86571  | 8-6571   | Liner                   | 1         |
| 4    | CS86578  | 8-6578   | Electrode, Gen. Purpose | 5         |
|      | CS86586  | 8-6586   | Electrode, Lo-Amp       | 5         |
| 5    | CS86580  | 8-6580   | Tip, 100A               | 5         |
|      | CS86648  | 8-6648   | Tip, 150A               | 5         |
|      | CS86575  | 8-6575   | Tip, 200A               | 5         |
|      | CS86582  | 8-6582   | Tip, 300A               | 5         |
|      | CS86572  | 8-6572   | Tip, 400A               | 5         |
| 6    | CS86512  | 8-6512   | Gasket                  | 1         |
| 7    | CS86581  | 8-6581   | Outer Insulator         | 1         |
| 8    | CS86514  | 8-6514   | End Piece               | 1         |
| 9    | CS86515  | 806515   | End Cap                 | 1         |



**Replacement Parts Suitable for: THERMAL DYNAMICS M-200  
CC-65, CC-66, TA-500, TAC-500**








| Item | Part No. | Ref. No. | Description                | Std. Qty. |
|------|----------|----------|----------------------------|-----------|
| 1    | CS86060  | 8-6060   | Outer Insulator            | 1         |
| 2    | CS91640  | 9-1640   | Coolant Tube               | 1         |
| 3    | CS91642  | 9-1642   | Electrode Seat             | 1         |
| 4    | CS91662  | 9-1662   | Electrode, 1000A           | 5         |
|      | CS91641  | 9-1641   | Electrode, 500A            | 5         |
| 5    | CS86041  | 8-6041   | Tip, 150A                  | 5         |
|      | CS86042  | 8-6042   | Tip, 250A                  | 5         |
|      | CS86043  | 8-6043   | Tip, 350A                  | 5         |
|      | CS86044  | 8-6044   | Tip, 500A                  | 5         |
|      | CS86045  | 8-6045   | Tip, 750A                  | 5         |
|      | CS86046  | 8-6046   | Tip, 1000A                 | 5         |
|      | CS86068  | 8-6068   | Tip, Heavy Duty, 1000A     | 5         |
| 6    | CS92210  | 9-2210   | Inner Tip Retainer         | 1         |
| 7    | CS92451  | 9-2451   | Coolant Baffle             | 1         |
| 8    | CS86006  | 8-6006   | End Piece, Water Shield    | 1         |
|      | CS80607  | 8-0607   | End Piece, Gas Shield      | 1         |
|      | CS86029  | 8-6029   | End Piece, Ar/H2 Secondary | 1         |
| 9    | CS80563  | 8-0563   | O-Ring                     | 5         |
| 10   | CS86057  | 8-6057   | End Cap, Heavy Duty        | 1         |
|      | CS86077  | 8-6077   | End Cap, Underwater        | 1         |
|      | CS86056  | 8-6056   | End Cap                    | 1         |
| 11   | CS86059  | 8-6059   | Collar                     | 1         |

## Replacement Tips









| Acetylene - Oxygen            |  | Description   | Style | Size                               |
|-------------------------------|--|---|-------|------------------------------------|
|                               |  | <ul style="list-style-type: none"> <li>• Light preheat</li> <li>• For general cutting operations</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul>  | 124   | 00, 0, 1, 2, 3                     |
|                               |  | <ul style="list-style-type: none"> <li>• Light preheat</li> <li>• For general cutting operations with hand &amp; machine cutting apparatus</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul>        | 138   | 00, 0, 1, 2, 3, 4                  |
|                               |  | <ul style="list-style-type: none"> <li>• Medium preheat</li> <li>• For general cutting operations with hand or machine cutting apparatus</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul>          | 144   | 00, 0, 1, 2, 3, 4, 5, 6, 7, 8, 10  |
|                               |  | <ul style="list-style-type: none"> <li>• Very heavy preheat</li> <li>• For general cutting, also for use in cutting cast iron and stainless steel</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul> | 164   | 00, 0, 1, 2, 3, 4, 5, 6            |
|                               |  | <ul style="list-style-type: none"> <li>• Gouging</li> <li>• Medium to heavy preheat</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul>   | 183   | 6, 8, 10                           |
| Propane or Natural Gas-Oxygen |  | Description   | Style | Size                               |
|                               |  | <ul style="list-style-type: none"> <li>• Heavy preheat, general cutting</li> <li>• Two piece tip for hand cutting</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500, 2900 torches</li> </ul>                           | 261   | 0, 1, 2, 3, 4                      |
| MAPP-Propylene                |  | Description   | Style | Size                               |
|                               |  | <ul style="list-style-type: none"> <li>• General cutting</li> <li>• Single piece</li> <li>• Medium preheat</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul>  | A-SP  | 72, 68, 60, 56, 54, 52, 49, 44, 38 |
|                               |  | <ul style="list-style-type: none"> <li>• Hand and machine cutting</li> <li>• Two piece</li> <li>• Medium to heavy preheat</li> <li>• Fits Airco 3790, 4690, 4700, 4800, 5700, 5800, 1100, 3000, 9000, 9500 torches</li> </ul>                         | A-FS  | 72, 68, 60, 56, 54, 52, 49, 44, 38 |

Cutting Tips - AIRCO/Concoa



















## Replacement Tips

| Acetylene - Oxygen  | Description   | Style    | Size                                     | Cutting Tips - Harris             |
|---|---|----------|--|-----------------------------------|
|    | <ul style="list-style-type: none"> <li>• Medium preheat, general hand cutting</li> <li>• Fits Harris 42-3, 62-3, 72, 72A, 73, 73A, 63-2, and 85 series torches.</li> </ul>                        | 6290     | 00, 0, 1, 2, 3, 4, 5, 6                  |                                   |
| Propane or Natural Gas-Oxygen   | Description   | Style    | Size                                     |                                   |
|    | <ul style="list-style-type: none"> <li>• Heavy preheat, general cutting</li> <li>• Two piece</li> <li>• Fits Harris 42-3F, 49AF, 49F, 62-3F, 85, 72, 73, and 142 series torches.</li> </ul>       | 6290-NFF | 0, 1, 2, 3, 4, 5, 6                      |                                   |
|    | <ul style="list-style-type: none"> <li>• Medium preheat, general cutting</li> <li>• Two piece</li> <li>• Fits Harris 42-3F, 49AF, 49F, 62-3F, 85, 72, 73, 142 series torches.</li> </ul>          | 6290-NX  | 00, 0, 1, 2, 3, 4, 5, 6                  |                                   |
|  | <ul style="list-style-type: none"> <li>• High speed tips, for use in machine cutting</li> <li>• Two piece</li> <li>• Fits Harris 98-2 and 98-3 machine torches</li> </ul>                         | 6290-VVC | 000, 00, 0, 0.5, 1, 1.5, 2, 2.5, 3, 4, 5 |                                   |
| Acetylene - Oxygen  | Description   | Style    | Size                                     | Cutting Tips - Marquette          |
|  | <ul style="list-style-type: none"> <li>• General hand and scrap cutting</li> <li>• Medium preheat</li> <li>• Fits Marquette 20-110 super jet and 21-110 star jet torches</li> </ul>               | GW-6     | 0, 1, 2, 3, 4                            |                                   |
| Acetylene - Oxygen  | Description   | Style    | Size                                     | Cutting Tips - MECO               |
|  | <ul style="list-style-type: none"> <li>• General cutting</li> <li>• One piece</li> <li>• Fits Weldmaster, Cutmaster, SCA torches</li> </ul>   | LA-6     | 00, 0, 1, 2, 3, 4, 5                     |                                   |
| Acetylene - Oxygen  | Description   | Style    | Size                                     | Cutting Tips - Oxweld/Linde/L-TEC |
|  | <ul style="list-style-type: none"> <li>• Medium pre-heat</li> <li>• For hand or machine cutting</li> <li>• Fits CW-32, C-31, C-23, C-77 hand torches, C-37, C-39, C-58 machine torches</li> </ul> | 1502     | 2, 3, 4, 6, 8, 10, 12                    |                                   |

## Replacement Tips

|   |   |   |                            |                                    |
|---|---|---|----------------------------|------------------------------------|
| Cutting Tips for Purox/Linde/L-Tec  | Acetylene - Oxygen  | Description   | Style                      | Size                               |
|   |    | <ul style="list-style-type: none"> <li>• Medium preheat for general cutting</li> <li>• Fits CW-200, CW-202, Type E torches, C-205 machine torch, CW-300 torches</li> </ul>  | 4202                       | 2, 3, 4, 5,<br>7, 9, 11, 13        |
|   | Propane or Natural Gas - Oxygen   | Description   | Style                      | Size                               |
|    | <ul style="list-style-type: none"> <li>• Two piece, general cutting</li> <li>• Complete tip, medium preheat</li> <li>• Fits CW-200, CW-202, Type E torches</li> <li>• For CW-300 torches</li> </ul> | 4213-14   | 3, 4, 5, 7                 |                                    |
| Cutting Tips - Rexarc (Rego)  | MAPP or FG-2 Oxygen   | Description   | Style                      | Size                               |
|   |    | <ul style="list-style-type: none"> <li>• General cutting</li> <li>• Two piece tip standard speed</li> <li>• Fits CW-200, CW-202, Type E, CW-300 torches</li> </ul>  | P-FS                       | 49, 52, 56, 60, 68                 |
| Cutting Tips - Smith  | Acetylene - Oxygen  | Description   | Style                      | Size                               |
|   |    | <ul style="list-style-type: none"> <li>• General cutting</li> <li>• Light preheat</li> <li>• 4 Preheat holes</li> </ul>   | KX-6                       | 68                                 |
|   |    | <ul style="list-style-type: none"> <li>• Medium preheat for hand cutting</li> <li>• Fits KXA, LXA, SXA, CWP 9000, 7000, 18000, 8720, 6808, 6912, 6916 torches</li> <li>• 6 Preheat holes</li> </ul>   | KX-66<br>KX-6              | 62, 56<br>53, 51, 46, 42, 35       |
| Cutting Tips - Smith  | Acetylene - Oxygen  | Description   | Style                      | Size                               |
|   |    | <ul style="list-style-type: none"> <li>• General cutting</li> <li>• Medium duty hand cutting</li> <li>• Fits cutting assemblies Pipeliner MC505, MC509, Airliner AC305, AC309</li> </ul>  | MC12                       | 00, 0, 1, 2, 3, 4                  |
|   |    | <ul style="list-style-type: none"> <li>• For hand or machine cutting</li> <li>• MC409, SC170, SC200, SC220, SC270, SC360, SC720, SC730, SC770, SC771, SC780, SC780A, SC781A, SC782A, SC850, SC860, SC890 Series</li> <li>• Cutting torches Tuf-Tony, Silver Star (000-7)</li> </ul> | SC12                       | 000, 00, 0, 1, 2,<br>3, 4, 5, 6, 7 |
|   | Propane or Natural Gas - Oxygen   | Description   | Style                      | Size                               |
|  | <ul style="list-style-type: none"> <li>• Hand and machine cutting</li> <li>• Two piece</li> <li>• Medium to heavy preheat</li> </ul>  | SC50  | 00, 0, 1, 2,<br>3, 4, 5, 6 |                                    |

Replacement Tips

| Acetylene - Oxygen  |   | Description   | Style | Size                               |
|---|---|---|-------|------------------------------------|
|    |    | <ul style="list-style-type: none"> <li>Medium preheat for hand and machine cutting</li> <li>Fits CA2460, CA1060, ST, SST, CA350 machine torches, Q2000</li> </ul>   | 1-101 | 000, 00, 0, 1, 2, 3, 4, 5, 6, 7, 8 |
|    |    | <ul style="list-style-type: none"> <li>Gouging</li> <li>Medium preheat</li> <li>Fits CA2460, CA1060, ST, SST, CA350 machine torches, Q2000</li> </ul>   | 1-118 | 0, 2, 4, 6, 8                      |
|    |    | <ul style="list-style-type: none"> <li>Medium preheat hand cutting</li> <li>Fits CA1260, CA1350, C-1450, CA250 CA2060, CA2470, CST 800, C 1400 torches.</li> </ul>  | 3-101 | 000, 00, 0, 1, 2, 3, 4, 5          |
| Propane - Natural Gas   |   | Description   | Style | Size                               |
|   |   | <ul style="list-style-type: none"> <li>Two piece medium preheat series 3 tip</li> <li>Fits CA1260, CA1350, C-1450, CA250 CA2060, CA2470, CST 800, C1400 torches</li> </ul>  | 3-GPN | 0, 1, 2, 3, 4                      |
|  |  | <ul style="list-style-type: none"> <li>Two piece medium preheat for hand, machine and general cutting</li> <li>Fits CA2450, CA1060, CAN 1060, ST, SST, STN, machine torches</li> </ul>  | GPN   | 000, 00, 0, 1, 2, 3, 4, 5, 6, 7, 8 |
|  |  | <ul style="list-style-type: none"> <li>Medium and heavy preheat</li> <li>Hand and machine cutting, two piece</li> <li>Fits CA2450, CA1060, CAN 1060, ST, SST, STN, machine torches</li> </ul>   | 2V-FS | 72, 68, 60, 56, 54, 52, 49, 44, 38 |
|   |  | <ul style="list-style-type: none"> <li>Medium and heavy preheat</li> <li>Hand cutting, Two piece</li> </ul>   | 3V-FS | 68, 60, 56, 52, 49                 |
| Acetylene - Oxygen  |   | Description   | Style | Size                               |
|  | Style W   | <ul style="list-style-type: none"> <li>Complete nozzle (nozzle nut included)</li> <li>General welding and preheating</li> <li>Fits 300 series torches</li> </ul>  | W     | 00, 0, 1, 2, 3, 4, 5, 6            |
|   | Style W-1   | <ul style="list-style-type: none"> <li>Complete nozzle (nozzle not included)</li> <li>Long cone flame general welding &amp; brazing</li> <li>Fits 100 series torches</li> </ul>   | W-1   | 00, 0, 1, 2, 3, 4, 5, 6, 7         |
| Acetylene or Hydrogen-Oxygen  |   | Description   | Style | Size                               |
|  |  | <ul style="list-style-type: none"> <li>Multiflame nozzle for preheating and straightening</li> <li>Fits 300 series torches</li> <li>* Use HD 310C torch with 3/8 hose, manifold if acetylene withdrawal rate exceeds 1/7 cylinder content per hour</li> </ul> | MFA   | 6, 8                               |
|  |  | <ul style="list-style-type: none"> <li>Fits 100 series torches</li> </ul>   | MFA-1 | 6, 8                               |

Cutting Tips - Victor

Welding Tips - Victor

Heating Tips - Victor

## Tungsten Electrodes

| Electrodes      | Ground Part No. | Dia. | Length |
|-----------------|-----------------|------|--------|
| Pure            | 0407G           | .040 | 7      |
|                 | 1167G           | 1/16 | 7      |
|                 | 3327G           | 3/32 | 7      |
|                 | 187G            | 1/8  | 7      |
| 2% Thoriated    | 0407GT2         | .040 | 7      |
|                 | 1167GT2         | 1/16 | 7      |
|                 | 3327GT2         | 3/32 | 7      |
|                 | 187GT2          | 1/8  | 7      |
| 1.5 Lanthanated | 1167GL          | 1/16 | 7      |
|                 | 3327GL          | 3/32 | 7      |
|                 | 187GL           | 1/8  | 7      |

All tungsten electrodes are packaged 10 pieces per box.

### ANSI AWS A5.12-92 Classification System

Tungsten electrodes are classified on the basis of their chemical compositions.

**E:** stands for an electrode

**W:** stands for the chemical symbol for tungsten (also called Wolfram)

The final letter indicates the alloying element or oxide additions.

**P:** Pure

**Th:** Thoriated

**La:** Lanthanated

**G:** stands for unspecified oxide additions

The numbers specify the nominal alloying composition (in weight - percent). For instance, EWTH-2 is a thoriated tungsten electrode that contains nominally 2 wt - % thoria.

### Standard Sizes

| Standard Sizes, inches |             |
|------------------------|-------------|
| Nominal Size           | Actual Size |
| 0.040                  | 0.040       |
| 1/16                   | 0.062       |
| 3/32                   | 0.093       |
| 1/8                    | 0.125       |
| 5/32                   | 0.156       |



For more information regarding tungsten electrodes: A Guide to the Use of Tungsten Electrodes for GTA Welding, as printed in the Welding Journal Authors: R.D. Campbell and E.J. LaCourse

The basics regarding tungsten electrode classifications, types, sizes, current types and levels, and recommended uses are explained.

### Classification of Electrodes

#### Pure Tungsten

**Color Code: Green**

These electrodes are used mainly with alternating current (AC) for welding of aluminum and magnesium alloys. With this type of current, the tip of the EWP electrode forms a clean, balled end, which provides good arc stability. Pure tungsten is the least expensive, but is more prone to contamination of the weld than the other types of tungsten electrodes.

#### Thoriated Tungsten

**Color Code: 2% Red**

Thoriated tungsten electrodes, were designed for direct current electrode negative (DCEN) or straight polarity applications. They maintain a sharpened tip configuration during welding which is desirable for the welding of steels, nickel alloys, and most alloys other than aluminum and magnesium. Thoriated tungsten electrodes are not normally used with AC welding because it is difficult to maintain the balled end ( which is necessary with AC welding) without splitting the electrode.

#### Lanthanated Tungsten

**Color Code: Gray**

These electrodes can be used as a nonradioactive substitute for 2% thoriated tungsten. They will provide very similar performance with minimum amount of adjustment of operating conditions required. These materials are certified to be free of radioactivity.

### Tungsten Electrode Finishes

#### Ground Finished

Ground finished tungsten electrodes are cleaned of impurities following centerless grinding, which is done to produce a uniform size and to remove surface imperfections.

### Selection of Gases for Gas Tungsten Arc Welding (GTAW)

| Metal                                      | Type of Welding Process | Shielding Gas                           | Advantages   |
|--|-------------------------|---|--|
| Aluminum and its Alloys                    | Manual continuous       | Argon                                   | Better arc starting and cleaning action; lower gas consumption.  |
|  | Manual continuous       | Helium                                  | High welding speeds possible.  |
|  | Machine continuous      | Argon-Helium                            | Lower gas flow than required with straight helium.   |
| Magnesium and its Alloys                   | Less than 1/14 in.      | Argon                                   | Controlled penetration; excellent cleaning; ease of puddle manipulation; low gas flow.                                       |
|  | Greater than 1/14 in.   | Helium                                  | Good penetration; best for d-c welding.  |
| Carbon Steel                               | Manual continuous       | Argon                                   | Ease of manipulation; freedom from overheating; better puddle control, especially for position welding.                      |
|  | Machine continuous      | Argon-Helium                            | Helium addition improves penetration on heavy gage metal; preference depends on joint preparation.                           |
|  | Spot                    | Argon                                   | Generally preferred for longer electrode life, better weld nugget contour, ease of starting, lower gas flow.                 |
| Austenitic Chromium-Nickel Stainless Steel | Manual continuous       | Argon                                   | Permits controlled penetration on thin-gage material (up to 15 gage).  |
|  | Manual continuous       | Argon-Helium                            | Higher heat input and welding speeds possible on heavier gages.  |
|  | Machine continuous      | Argon-Hydrogen (35% H <sub>2</sub> max) | Prevents undercutting; produces desirable weld contour at low current levels; requires lower gas flows.                      |
|  | Machine continuous      | Helium                                  | Provides highest heat input and deepest penetration.   |
| Copper, Nickel and their Alloys            |                         | Argon                                   | Ease of obtaining puddle control, penetration and bead contour on thin-gage metal.   |
|  |                         | Argon-Helium                            | Higher heat input to offset high conductivity of heavier gages.  |
|  |                         | Helium                                  | Highest heat input for high welding speed on heavy metal section.  |
| Titanium and its Alloys                    |                         | Argon                                   | Low gas flow rate minimizes turbulence and air contamination of weld.  |
|  |                         | Helium                                  | Better penetration for welding of thick sections ( inert-gas backing required to shield back of weld against contamination). |