

# CUTTING TIPS



## High Quality Gas Cutting Tips



### *Features & Benefits*

#### ■ Design

Each Koike cutting tip is designed for proper gas efficiency and to provide the highest cutting accuracy possible

#### ■ Safety

All 100 series and Epoch series cutting tips are designed to help prevent damaging flashbacks and backfires into the torch

#### ■ Quality

Every cutting tip is checked for form, fit and function then fired and cycled to ensure that the preheat flame and jet oxygen are of Koike quality

#### ■ Lifetime Torch Warranty

Koike 100 series torches carry a lifetime warranty against a damaging sustained flashback while using genuine Koike cutting tips

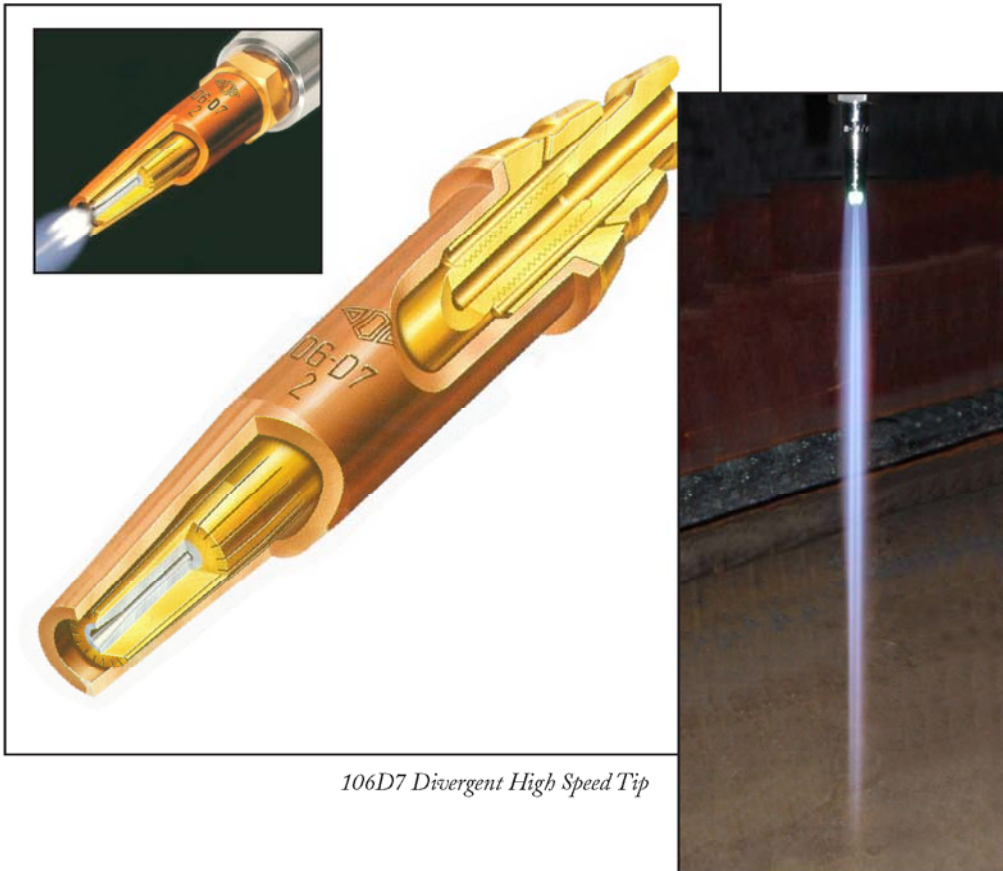
*(IK-82 torches excluded)*



**KOIKE ARONSON, INC.**



## GAS CUTTING TIPS



106D7 Divergent High Speed Tip

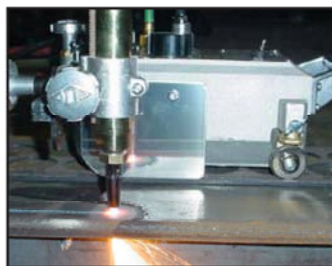
### How Koike Tips Achieve the Most Accurate Cutting

Koike enjoys a world-wide reputation as a leader in the field of gas cutting machines. Koike's reputation is due in large part to their finely crafted gas cutting tips. Since a poor tip can ruin the performance of an excellent cutting machine, Koike has concentrated its efforts on research and development of gas cutting tips.

Koike's approach sets it apart from its competition by virtue of their commitment to continuously fund research and development of their cutting systems.

Koike's clients benefit from their long history of gas cutting manufacture, torch research and development, and experience cutting various materials with such innovations as test machines to check tip efficiency. Superior customer support means superior cutting tip performance.

If you want your cutting tips manufactured to rigorous standards so that they cut accurately, safely and economically, then Koike is your choice.



### High Quality Cuts

To ensure tip quality, Koike checks the surface obtained by real cutting and uses the following criteria to achieve a quality cutting surface:

- Even cutting surface (small kerf)
- No top slag
- Minimal upper edge melt
- No bottom slag

In addition to satisfying the previously mentioned criteria, Koike demands that its tips also meet the following conditions:

- Cutting operation with high speed
- A steady and safe cutting operation
- Cutting with efficient gas consumption

To achieve the above criteria and conditions a Koike tip must maintain superior oxygen cutting flow and an efficient yet, uniform pre-heat flame. To do this Koike researched:

- Various tip shapes and sizes of the inlet part of the cutting oxygen tip
- Pre-heat oxygen and fuel gas mixtures in the pipes, the gas mixing chamber, and the ejection outlet

As a result of this work Koike developed the divergent tip. The cutting outlet of this tip has a divergent shape to it. This tip is the result of extensive engineering design by the Koike engineering department.

Koike uses a unique patented stainless steel lining to ensure the divergent tips durability. The divergent tip technology was developed to process small holes of non-flight metal.

Koike's commitment to research and design of gas cutting tips is demonstrated in the high quality of its finished product.

## Koike Tips Increase Cutting Safety

Since gas welding and cutting operations are particularly vulnerable to explosions and other unwanted accidents, any small flame and flash-up must be avoided. Consequently, Koike is committed to ensure safe cutting operations for its clients. In the area relating to tip design, significant attention has been paid to the prevention of backfire.

Backfire can be classified in to three types:

1. Backfire: Pre-heat oxygen flows back into the torch
2. Flashback: The flame flashes at the tip edge
3. Sustained Flashback: Flows back to the gas mixing point of the tip and melts it

The most dangerous of these are the flashback and sustained flashback. Koike has resolved these two conditions through its rigorous research and design process. With regards to flashback, Koike has developed the venturi effect of the tip for fuel. Conventional middle-pressure tips may force the backflow of pre-heat oxygen into the fuel gas which introduces mixing gas into

the mixing tube. This is usually encountered with difficult situations concerning the torch itself or with the sheet being cut. The flashback occurs when the fuel is supplied. Koike's solution to this is to provide the venturi effect to the cutting tip. This is done by means of the high-speed pre-heat oxygen. Fuel Gas is sucked into the tip in order to prevent the mixing gas in the torch pipe, and thus flashback during ignition is prevented.

The sustained flashback might occur when the tip is clogged up with slag during the cutting operation. Koike has found that the ideal proportion of the diameter between pre-heat oxygen, fuel gas and gas mixing chamber will produce an extinguishing effect of the flame when the tip is clogged up. The sustained flashback as well as the backfire is thus prevented.

Prevention of backfire is one of the examples of how Koike strives for better products, sparing nothing in its research, design and manufacturing.

## Koike Tips - A Wide Variety to Fit Your Needs

### LPG GAS - Koike's Standard

|       |   |
|-------|---|
| 106   | Standard tip  |
| 106HC | Standard tip for hand cutting and portable cutting    |
| 106D7 | Divergent high speed tip                              |
| 106M  | Heavy pre-heat oxygen tip                             |
| 106M7 | Heavy pre-heat oxygen tip (divergent high-speed type) |
| 106Q7 | Divergent high speed tip (only for one quick torch)   |
| 406NT | Standard tip (only for IK-82)                         |
| EPOCH | Out mixing type tip (only for Epoch torch)            |

### LPG GAS - Victor™ and Oxweld™ Type

|       |  |
|-------|--|
| 2VKP7 | Divergent high speed tip (only for Victor™ type torch) |
| OKP7  | Divergent high speed tip (only for Oxweld™ type torch) |

### ACETYLENE - Koike's Standard

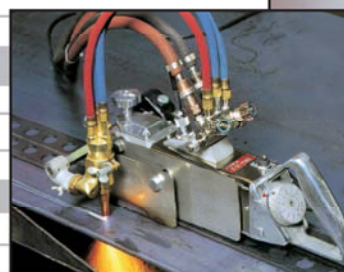
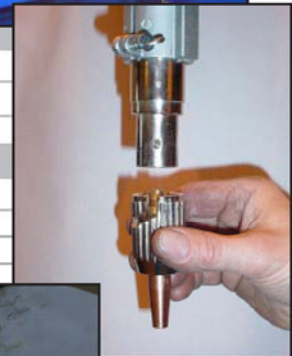
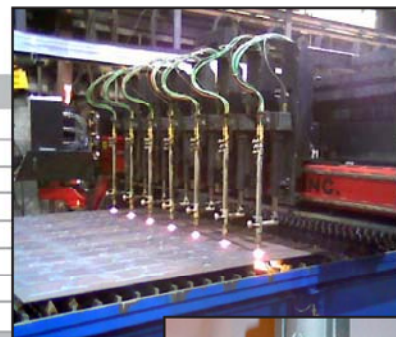
|       |  |
|-------|--|
| 102   | Standard tip                                       |
| 102HC | Standard tip for hand cutting and portable cutting |
| 102D7 | Divergent high speed tip                           |
| 402ST | Standard tip (only for IK-82)                      |

### FOR MAPP™, HPG™ AND CHEMTANE2™ - Koike's Standard

|       |                          |
|-------|--------------------------|
| 103   | Standard tip             |
| 103D7 | Divergent high speed tip |

### FOR NATURAL GAS - Koike's Standard

|       |                          |
|-------|--------------------------|
| 107   | Standard tip             |
| 107D7 | Divergent high speed tip |



# LPG GAS CUTTING TIPS - Koike's Standard

## 106 • Standard Tip



Inches

| Plate Thickness | Tip No. | Cutting Speed In/min | Oxygen PSIG Cutting | Oxygen PSIG Preheat* | Fuel PSIG | Kerf Width |
|-----------------|---------|----------------------|---------------------|----------------------|-----------|------------|
| 1/8             | 00      | 27                   | 20                  | 20                   | 2.8       | 0.04       |
| 1/4             | 0       | 24                   | 30                  | 30                   | 2.8       | 0.05       |
| 3/8             | 0       | 22                   | 30                  | 30                   | 2.8       | 0.06       |
| 1/2             | 1       | 21                   | 40                  | 40                   | 2.8       | 0.07       |
| 3/4             | 2       | 18                   | 45                  | 45                   | 3.6       | 0.08       |
| 1               | 2       | 17                   | 45                  | 45                   | 3.6       | 0.08       |
| 1 1/2           | 3       | 14                   | 45                  | 45                   | 3.6       | 0.09       |
| 2               | 4       | 12.5                 | 45                  | 45                   | 4.3       | 0.11       |
| 2 1/2           | 5       | 11                   | 55                  | 55                   | 4.3       | 0.12       |
| 3               | 5       | 10                   | 55                  | 55                   | 4.3       | 0.12       |
| 4               | 6       | 8                    | 55                  | 55                   | 5.7       | 0.14       |
| 5               | 6       | 7                    | 55                  | 55                   | 5.7       | 0.14       |
| 6               | 7       | 6                    | 65                  | 65                   | 5.7       | 0.16       |
| 8               | 7       | 5                    | 65                  | 65                   | 5.7       | 0.17       |
| 10              | 8       | 3                    | 65                  | 65                   | 5.7       | 0.23       |
| 12              | 8       | 2                    | 65                  | 65                   | 5.7       | 0.27       |

Metric

| Plate Thickness | Tip No. | Pressure kg/cm <sup>2</sup> Oxygen | Fuel Gas | Consumption NI/hr Cutting Oxygen | Preheat Oxygen | Fuel Gas | Cutting Speed mm/min |
|-----------------|---------|------------------------------------|----------|----------------------------------|----------------|----------|----------------------|
| 5               | 00      | 1.5                                | 0.2      | 690                              | 1180           | 310      | 660                  |
| 5 - 10          | 0       | 2.0                                | 0.2      | 1200                             | 1180           | 310      | 660 - 550            |
| 10 - 15         | 1       | 2.5                                | 0.2      | 2100                             | 1180           | 310      | 550 - 490            |
| 15 - 30         | 2       | 3.0                                | 0.25     | 3400                             | 1370           | 360      | 490 - 400            |
| 30 - 40         | 3       | 3.0                                | 0.25     | 4300                             | 1370           | 360      | 400 - 350            |
| 40 - 50         | 4       | 3.5                                | 0.3      | 6500                             | 1860           | 490      | 350 - 320            |
| 50 - 100        | 5       | 4.0                                | 0.3      | 11000                            | 1860           | 490      | 320 - 200            |
| 100 - 150       | 6       | 4.0                                | 0.3      | 15000                            | 3040           | 800      | 200 - 150            |
| 150 - 250       | 7       | 4.5                                | 0.4      | 22000                            | 3720           | 980      | 150 - 80             |
| 250 - 300       | 8       | 4.5                                | 0.4      | 28000                            | 3720           | 980      | 80 - 45              |

## 106HC • Standard Tip (for hand cutting and portable cutting)



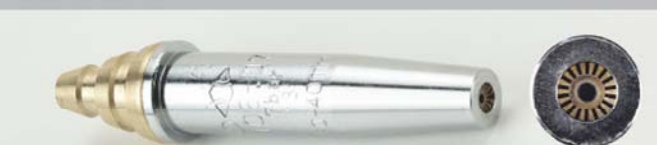
Inches

| Plate Thickness | Tip No. | Cutting Speed In/min | Oxygen PSIG Cutting | Oxygen PSIG Preheat* | Fuel PSIG | Kerf Width |
|-----------------|---------|----------------------|---------------------|----------------------|-----------|------------|
| 1/8             | 00      | 27                   | 20                  | 20                   | 2.8       | 0.04       |
| 1/4             | 0       | 24                   | 30                  | 30                   | 2.8       | 0.05       |
| 3/8             | 0       | 22                   | 30                  | 30                   | 2.8       | 0.06       |
| 1/2             | 1       | 21                   | 40                  | 40                   | 2.8       | 0.07       |
| 3/4             | 2       | 18                   | 45                  | 45                   | 3.6       | 0.08       |
| 1               | 2       | 17                   | 45                  | 45                   | 3.6       | 0.08       |
| 1 1/2           | 3       | 14                   | 45                  | 45                   | 3.6       | 0.09       |
| 2               | 4       | 12.5                 | 45                  | 45                   | 4.3       | 0.11       |
| 2 1/2           | 5       | 11                   | 55                  | 55                   | 4.3       | 0.12       |
| 3               | 5       | 10                   | 55                  | 55                   | 4.3       | 0.12       |
| 4               | 6       | 8                    | 55                  | 55                   | 5.7       | 0.14       |
| 5               | 6       | 7                    | 55                  | 55                   | 5.7       | 0.14       |
| 6               | 7       | 6                    | 65                  | 65                   | 5.7       | 0.16       |
| 8               | 7       | 5                    | 65                  | 65                   | 5.7       | 0.17       |
| 10              | 8       | 3                    | 65                  | 65                   | 5.7       | 0.23       |
| 12              | 8       | 2                    | 65                  | 65                   | 5.7       | 0.27       |

Metric

| Plate Thickness | Tip No. | Pressure kg/cm <sup>2</sup> Oxygen | Fuel Gas | Consumption NI/hr Cutting Oxygen | Preheat Oxygen | Fuel Gas | Cutting Speed mm/min |
|-----------------|---------|------------------------------------|----------|----------------------------------|----------------|----------|----------------------|
| 5               | 00      | 1.5                                | 0.2      | 690                              | 1180           | 310      | 660                  |
| 5 - 10          | 0       | 2.0                                | 0.2      | 1200                             | 1180           | 310      | 660 - 550            |
| 10 - 15         | 1       | 2.5                                | 0.2      | 2100                             | 1180           | 310      | 550 - 490            |
| 15 - 30         | 2       | 3.0                                | 0.25     | 3400                             | 1370           | 360      | 490 - 400            |
| 30 - 40         | 3       | 3.0                                | 0.25     | 4300                             | 1370           | 360      | 400 - 350            |
| 40 - 50         | 4       | 3.5                                | 0.3      | 6500                             | 1860           | 490      | 350 - 320            |
| 50 - 100        | 5       | 4.0                                | 0.3      | 11000                            | 1860           | 490      | 320 - 200            |
| 100 - 150       | 6       | 4.0                                | 0.3      | 15000                            | 3040           | 800      | 200 - 150            |
| 150 - 250       | 7       | 4.5                                | 0.4      | 22000                            | 3720           | 980      | 150 - 80             |
| 250 - 300       | 8       | 4.5                                | 0.4      | 28000                            | 3720           | 980      | 80 - 45              |

## 106D7 • Divergent High Speed Tip



Inches

| Plate Thickness | Tip No. | Cutting Speed In/min | Oxygen PSIG Cutting | Oxygen PSIG Preheat* | Fuel PSIG | Kerf Width |
|-----------------|---------|----------------------|---------------------|----------------------|-----------|------------|
| 1/8             | 00      | 31.5                 | 100                 | 20                   | 2.8       | 0.03       |
| 1/4             | 0       | 29                   | 100                 | 30                   | 2.8       | 0.04       |
| 3/8             | 0       | 27                   | 100                 | 30                   | 2.8       | 0.05       |
| 1/2             | 1       | 25                   | 100                 | 40                   | 2.8       | 0.05       |
| 3/4             | 2       | 22                   | 100                 | 45                   | 3.6       | 0.06       |
| 1               | 2       | 20                   | 100                 | 45                   | 3.6       | 0.07       |
| 1 1/2           | 3       | 18                   | 100                 | 45                   | 3.6       | 0.08       |
| 2               | 4       | 16                   | 100                 | 45                   | 4.3       | 0.10       |
| 2 1/2           | 5       | 14                   | 100                 | 55                   | 4.3       | 0.11       |
| 3               | 5       | 12.5                 | 100                 | 55                   | 4.3       | 0.11       |
| 4               | 6       | 10                   | 100                 | 55                   | 5.7       | 0.13       |
| 5               | 6       | 9                    | 100                 | 55                   | 5.7       | 0.14       |
| 6               | 7       | 7                    | 100                 | 65                   | 5.7       | 0.14       |
| 8               | 7       | 5.5                  | 100                 | 65                   | 5.7       | 0.18       |
| 10              | 8       | 4                    | 100                 | 65                   | 5.7       | 0.20       |
| 12              | 8       | 3                    | 100                 | 65                   | 5.7       | 0.24       |

Metric

| Plate Thickness | Tip No. | Pressure kg/cm <sup>2</sup> Oxygen | Fuel Gas | Consumption NI/hr Cutting Oxygen | Preheat Oxygen | Fuel Gas | Cutting Speed mm/min |
|-----------------|---------|------------------------------------|----------|----------------------------------|----------------|----------|----------------------|
| 5               | 00      | 7.0                                | 0.2      | 750                              | 1180           | 310      | 750                  |
| 5 - 10          | 0       | 7.0                                | 0.2      | 1100                             | 1180           | 310      | 750 - 680            |
| 10 - 15         | 1       | 7.0                                | 0.2      | 2500                             | 1180           | 310      | 680 - 600            |
| 15 - 30         | 2       | 7.0                                | 0.25     | 3800                             | 1370           | 360      | 600 - 500            |
| 30 - 40         | 3       | 7.0                                | 0.25     | 5400                             | 1370           | 360      | 500 - 450            |
| 40 - 50         | 4       | 7.0                                | 0.3      | 7300                             | 1860           | 490      | 450 - 400            |
| 50 - 100        | 5       | 7.0                                | 0.3      | 10000                            | 1860           | 490      | 400 - 260            |
| 100 - 150       | 6       | 7.0                                | 0.3      | 14000                            | 3040           | 800      | 260 - 180            |
| 150 - 250       | 7       | 7.0                                | 0.4      | 22000                            | 3720           | 980      | 180 - 100            |
| 250 - 300       | 8       | 7.0                                | 0.4      | 35000                            | 3720           | 980      | 100 - 70             |

\*Preheat oxygen pressure for 3 bore torch only

## 106M • Standard Tip • Heavy Preheat Oxygen Tip



Inches

| Plate Thickness | Tip No. | Cutting Speed In/min | Oxygen PSIG Cutting | Oxygen PSIG Preheat* | Fuel PSIG | Kerf Width |
|-----------------|---------|----------------------|---------------------|----------------------|-----------|------------|
| 1/8             | 00      | 27                   | 20                  | 20                   | 2.8       | 0.04       |
| 1/4             | 0       | 24                   | 30                  | 30                   | 2.8       | 0.05       |
| 3/8             | 0       | 22                   | 30                  | 30                   | 2.8       | 0.06       |
| 1/2             | 1       | 21                   | 40                  | 40                   | 2.8       | 0.07       |
| 3/4             | 2       | 18                   | 45                  | 45                   | 3.6       | 0.08       |
| 1               | 2       | 17                   | 45                  | 45                   | 3.6       | 0.08       |
| 1 1/2           | 3       | 14                   | 45                  | 45                   | 3.6       | 0.09       |
| 2               | 4       | 12.5                 | 45                  | 45                   | 4.3       | 0.11       |
| 2 1/2           | 5       | 11                   | 55                  | 55                   | 4.3       | 0.12       |
| 3               | 5       | 10                   | 55                  | 55                   | 4.3       | 0.12       |
| 4               | 6       | 8                    | 55                  | 55                   | 5.7       | 0.14       |
| 5               | 6       | 7                    | 55                  | 55                   | 5.7       | 0.14       |
| 6               | 7       | 6                    | 65                  | 65                   | 5.7       | 0.16       |
| 8               | 7       | 5                    | 65                  | 65                   | 5.7       | 0.17       |
| 10              | 8       | 3                    | 65                  | 65                   | 5.7       | 0.23       |
| 12              | 8       | 2                    | 65                  | 65                   | 5.7       | 0.27       |

Metric

| Plate Thickness | Tip No. | Pressure kg/cm <sup>2</sup> Oxygen | Fuel Gas | Consumption NI/hr Cutting Oxygen | Preheat Oxygen | Fuel Gas | Cutting Speed mm/min |
|-----------------|---------|------------------------------------|----------|----------------------------------|----------------|----------|----------------------|
| 5               | 00      | 1.5                                | 0.2      | 690                              | 1710           | 450      | 660                  |
| 5 - 10          | 0       | 2.0                                | 0.2      | 1200                             | 1710           | 450      | 660 - 550            |
| 10 - 15         | 1       | 2.5                                | 0.2      | 2100                             | 1710           | 450      | 550 - 490            |
| 15 - 30         | 2       | 3.0                                | 0.2      | 3400                             | 2470           | 650      | 490 - 400            |
| 30 - 40         | 3       | 3.0                                | 0.2      | 4300                             | 2470           | 650      | 400 - 350            |
| 40 - 50         | 4       | 3.5                                | 0.2      | 6500                             | 2470           | 650      | 350 - 320            |
| 50 - 100        | 5       | 4.0                                | 0.25     | 11000                            | 2890           | 760      | 320 - 200            |
| 100 - 150       | 6       | 4.0                                | 0.25     | 15000                            | 3570           | 940      | 200 - 150            |
| 150 - 250       | 7       | 4.5                                | 0.3      | 22000                            | 3990           | 1050     | 150 - 80             |
| 250 - 300       | 8       | 4.5                                | 0.3      | 28000                            | 3990           | 1050     | 80 - 45              |