

## EDM'ing AMPCO<sup>®</sup> and AMPCOLOY<sup>®</sup> Alloys

### Electro-erosion of AMPCO<sup>®</sup> Alloys

#### AMPCO<sup>®</sup> Alloys (18, 21, M4):

- These alloys can be easily electro-eroded with EDM machine settings similar to those used for tool steels in the mold industry.
- **Wire EDM:** Slightly longer working times compared to tool steels.

### Electro-erosion of AMPCOLOY<sup>®</sup> Alloys

#### AMPCOLOY<sup>®</sup> Alloys (940, 944, 95, 88, 83):

- Known for excellent thermal and electrical conductivity.
- **Machining Times:** Faster than AMPCO<sup>®</sup> alloys, but with higher electrode wear.

#### AMPCOLOY<sup>®</sup> 972:

- Can be used as a copper electrode.
- **Technology Settings:** Use the "copper-copper technology table" settings to reduce electrode wear.
- **Polarity:** Modern EDM machines typically use positive (+) polarity on AMPCOLOY<sup>®</sup> 972 electrodes and negative (-) on the part being eroded. On older machines, this might need to be reversed.

### Electrode Options and Settings

#### Copper-Tungsten Electrodes (AMPCOLOY<sup>®</sup> 10W):

- Less wear but slower machining speeds.
- Greater difficulty in machining the electrode.

#### Graphite Electrodes:

- Require good aspiration systems due to dirty machining.
- **Daily Use:** For customers using graphite electrodes daily, copper-infiltrated graphite electrodes (POCO EDM C200 and EDM C3) are recommended.
  - **POCO EDM C3:** For fine details and surface finishes (VDI 14 to VDI 20).
  - **POCO EDM C200:** For less fine details and lower surface finishes (VDI 24).

## Recommended Settings

### Graphite Electrodes:

- **Polarity:** Negative.
- **Intensity:** 9 A/cm<sup>2</sup> for rough EDM machining. Higher intensity results in less electrode wear.
- **Sparking Time:** Directly influences electrode wear.
  - < 10 A/cm<sup>2</sup>: 6 μs sparking time.
  - 15 A/cm<sup>2</sup>: 12 μs sparking time.
- **Pause Time:** Approximately 3 times the sparking time for stability.

### Efficiency Tips

- **Electrode Wear:** Reduced by three for AMPCOLOY® alloys.
- **Efficiency Improvement:** 25% for AMPCO® and AMPCOLOY® alloys.
- **Machining Close to Finished Size:** High-speed cutting tools are recommended.
- **Multiple Electrodes:** Manufacturing several electrodes or reshaping them is common practice due to low costs on high-speed cutting machining centers.