

EDM'ing AMPCO® and AMPCOLOY® Alloys

Electro-erosion of AMPCO® Alloys

AMPCO® 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® Alloys

AMPCOLOY® Alloys (940, 944, 95, 88, 83):

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

AMPCOLOY® 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® 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® 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/cm² for rough EDM machining. Higher intensity results in less electrode wear.
- **Sparking Time:** Directly influences electrode wear.
 - < 10 A/cm²: 6 μs sparking time.
 - 15 A/cm²: 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.