

Technical Spotlight

Submitted by Steve Broad

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Machine: ONA PD6.120A3

Electrode: POCO EDM-3

Application: Pallet base

The mold for this pallet base is one of the largest plastic injection molds produced by Aar-Kel Moulds. A single electrode was used as both the rougher and finisher for each area of the cavity. Roughing was done at a no-wear setting of 256 micro seconds on-time, 16 micro seconds off-time and 30 amps peak current. We manually program our roughing settings based on our experience, but we use the machine technology for an orbited finish operation. We go down to a 26 VDI finish and then do minimal hand polishing.

We produced two finished molds for this job and each mold had about 1,000 EDM hours. Since this job was symmetrical, we used the same electrode on the opposite corner. The electrode for the ribbed section was used four times. The ribs are 1 1/2" deep and 0.100" wide at the base. We used through hole flushing.

The finished pallet base uses a separate plastic center foot that inserts and locks into the base. Because the depth of ribs was critical this was a fit and function mold.

New Format for the EDM Technical Manual

The EDM Technical Manual has an all new look for its new format - CD-ROM. All the information that you are familiar with from the printed version is on a CD-ROM that can be used with either an IBM compatible or Mac system. We still publish the printed notebook version, but this new computer-based version will allow us to offer the user new ways to use this information and to add some new features.

Text & Glossary

The text from all the chapters is tied to the EDM Glossary. As you come across an EDM term that you are unfamiliar with, click on the word and the definition will appear if the word is included in the Glossary.

You can also select an item from the Index and it appears on the screen.

Performance Graphs

Just like the printed version, you can select the workmetal, electrode material, polarity and peak current setting and view the performance graph. An added feature is the ability to click on the graph for MRR, Wear or Finish and see an enlarged graph.

Graph Comparison

This selection lets you select and display two charts from a selected workmetal in order to compare the EDM performance. By selecting the MRR, CW, EW, SF button on the right of the screen, you will see the actual numbers that produced the graphs. By clicking on a data point, the other numbers will be displayed as performance variance percentages. The data can also be displayed in either English or metric numbers. There is also a button that lets you switch to the graph produced by the data.

Once you have looked at a set of parameters, a button will let you select a new top or bottom chart.

EDM Calculator

The formulas allow you to quickly calculate metal removal rate, percent wear, frequency or duty cycle. Simply fill in the numbers for your application and the computer will do the calculation.

Area Formulas

Need help determining the peak amperage for the size and shape of your electrode? This section has the formulas for a variety of shapes. You key in the required measurement and the computer calculates the area and the maximum peak current.

Graphite Machining Tip

Thread Milling

Thread milling is superior to tapping in graphite. Tapping holes in graphite can be a problem because the taps are designed to be used with metals and tend to chip the graphite and break the crest of the threads.

To thread mill, your machining center must be capable of helical interpolation because the tool moves in a spiral to produce accurate threads. Thread milling is done at higher RPM's than a tapping operation. Even though you are running at thousands of RPM, the chip load per tooth remains small and eliminates chipping of the graphite.

In most application, thread milling is faster and less expensive than tapping. One cutter can be used to produce different sized thread diameters of the same pitch rather than having a stock of individual taps for each requirement. A single cutter can be used for a left or right hand thread, eliminating the need for a hard-to-find left hand tap and die. One cutter will also produce internal and external threads replacing individual tap and die tools. There are also inserted cutters for large diameters.

Another issue is tool wear. Worn taps are thrown away, but your machine can be adjusted to compensate for wear of the cutter.

Blind holes - Threading blind holes in graphite with a cutter allows you to get closer to the bottom of the hole. The tool can get within one thread width of the bottom of the hole.

Small holes - Thread milling is difficult if the hole is under 1/4". A standard tap should be used for these small holes.