

EDM Graphite Buyer's Guide

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INTRODUCTION

Unless you have money to burn, time to spare, and a great mold repair team, never use words like "equivalent to" or "as good as" when purchasing your EDM graphite. These phrases or similar terms open the door for substitution of a lower quality inferior grade that will increase your frustrations in the electrode fabrication and EDM areas. If you do not specify exactly the grade you want delivered, you might as well open your wallet and prepare for a robbery. Blunt statements, but all too true.

Through the past three decades, I have been asked many questions concerning carbon and graphite. A question I used to get on a regular basis was, "Can you make white graphite?" I don't get this one very often anymore, either dark grey/black is in style or they just got tired of hearing my attempt at a technical explanation on why white graphite is not a possibility. Another common question is, "Do you make pencil lead?" The answer is yes, if you don't mind the pencil cutting through your paper and scratching your desk. On more than one occasion, I have been asked, "Where is your graphite mined?" A long explanation of natural graphite vs. man-made graphite is required.

More often I receive questions like these: "How do I know I am getting the grade ordered?", "Is there a simple test I can do in my shop to determine the grade of graphite being supplied?", and "With so many grades available, how do I know which grade is best for my EDM application?"

Too often our EDM applications engineers receive calls requesting technical assistance on a job where things are not going well in the electrode manufacturing area of the EDM machine, only to learn that the shop is using the incorrect grade of graphite for the application or they are not getting the grade they thought they had ordered. Often getting the correct electrode material gets the job back on track.

TESTING LAB

In the past 40 plus years, our lab has tested hundreds of manufacturers' grades and possibly thousands more being sold as reseller house brands. These grades are each tested for a wide range of physical properties, microstructure, and EDM performance (end wear, corner wear, surface finish, and metal removal rate). There have been approximately 78,000 graphite samples tested to date and the records and photo chip for every sample are maintained. The photo mount for sample number one, taken in 1970, is safely stored for reference if needed. This allows us to monitor changes in a grade over long periods of time and determine the manufacturer's grade for materials being sold under house brand names. Want to know the physical properties of one of our grades produced in 1980? No problem; we have the testing results and the sample from that period in our lab. Need to know if another manufacturer's grade or house brand grade has changed in the past few decades? We have the test results available and samples available to answer that question too.

GRAPHITE GRADES

Almost every manufacturer produces a series of grades for EDM applications. Some of the manufacturer grades are sold to EDM end users as the manufacturer's grade. When buying a manufacturer's grade, you often have more than one supplier offering the exact grade under the manufacturer's grade name and you also have a known manufacturer in case a concern develops with the material. Knowing the manufacturer and the distributor is a benefit to the customer. A common practice of some manufacturers is to allow resellers/distributors to rename or house brand their grades. House branding removes the tie to a specific manufacturer and specific manufacturer grade. House branding makes the reseller/distributor a sole source for their house brand. The exact manufacturer's grade may be sold as several other house brand grades, but the end users will not be aware that house brand A from company X is the same as house brand B from company Y, etc.

We do not allow our distributors to house brand our materials. When you order a specific graphite grade of ours it must be the same product regardless of the distributor chosen, the region of the world where you buy the graphite, or the length of time between your orders. Electrodes produced from our EDM-3® graphite ordered last week will perform just like EDM-3 graphite electrodes that have been in storage at a customer location for 20 years. The manufacturing process must be highly controlled and repeatable to generate consistency within a block, block to block, batch to batch, or decade to decade.

Almost a half century of highly controlled lab analysis indicates there are no grades that are exactly the same. Each manufacturing process yields a product with different physical properties, microstructure, and performance. In some cases the physical properties are similar, but the performance as an electrode material varies greatly. In other cases, there may be good EDM performance, but the material is too hard to machine into electrodes. To be a good EDM grade, the material must be very consistent, be capable of being machined to fine detail without chipping or wearing tools, and perform well in the EDM process. Excelling in all these areas defines a good EDM material.

In many cases the testing indicates the published specifications are highly exaggerated. For the most part, comparing published specifications is of little to no value since there is no policing of the specifications being published. Making buying decisions based solely on published specifications is not recommended.

GUIDELINES

I offer these simple guidelines when purchasing your EDM graphite requirements.

1. Determine the material grade best suited for your application and know why you are selecting that grade. Help in selecting the correct grade for your application is available if you need it.
2. Specify the exact grade you want and note "no substitution" on the quotation request, purchase order, email correspondence, etc.

3. Be on the lookout for words such as "like", "equivalent", or "type" on the quotation, acknowledgement, packing list, and invoice. Making it clear that "no substitution is allowed" will help assure that you are getting the exact grade you are ordering and for which you are paying.

4. Know the company supplying your EDM graphite very well. If you are new to EDM, ask other shops what graphite supplier they are using and their experience with the company. If you get a call out of the blue, offering prices too good to be true, beware. There are many companies in the EDM supply business that have developed a very good reputation for honesty, integrity, and ability to service our industry. Select and buy from one of these companies. They will supply you the exact grade you order, since their good reputation and livelihood are at stake. These companies will gladly provide a "certification of grade" if requested.

If you have specified the exact grade being ordered, stated "no substitution" on the documents, ordered from a company with a good reputation in the industry, and you still would like more assurance that the grade you received is exactly what you ordered, we have a solution. We will test a sample of the material at no cost to you. It is not necessary to disclose the grade or the supplier when sending the sample.

We all know that graphite, for the most part, looks the same, feels the same, smells the same, and probably tastes the same. However, no two graphite grades are the same in terms of consistency, quality, and performance. Being an educated buyer will ensure that you are always getting the exact material needed and ordered.

EDM TECHNICAL MANUAL

Our *EDM Technical Manual* is now available online at www.edmtechman.com or as an app for your iOS or Android device.



iOS Device



Android Device

FOR MORE INFORMATION

Please call your local distributor to learn what our premium graphite solutions can do for you. Visit poco.entegris.com/distributors for the location nearest you.

TERMS AND CONDITIONS OF SALE

All purchases are subject to Poco Graphite's Terms and Conditions of Sale. To view and print this information, visit poco.entegris.com/terms-and-conditions.



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