



 abrasive technology

# TECHVIEW

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## **POLISHING STONE WITH DIAMONDS: *HANDPADS***

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## Polishing stone with diamonds: Handpads

The use of diamonds is not at all new to the stone processing industry. For years, diamond saw blades have been critical in a stone shop's ability to process stone slabs. But this wasn't always the case.

Fabricators who have been in business for a few decades remember the days when saw blades made of black silicon carbide were the primary tools used for slab cutting. Although these blades cut well, they wore out too fast, even while cutting softer stones such as marble. It's no exaggeration to say that when fabricators were working with hard stone (such as granite), they virtually had to order silicon carbide saw blades by the truckload because the blades deteriorated so rapidly.

Yet, when diamond saw blades were introduced more than 25 years ago, they were not readily accepted because they were literally hundreds of times more expensive than silicon carbide saw blades. However, the cost effectiveness of diamonds paid off. Today diamond saw blades are so popular, it is nearly inconceivable to cut stone with anything else.

When it comes to polishing, regular abrasives such as silicon carbide are still being used. But to progressive fabricators, diamonds are the best alternative. Their strong crystals are many times harder than any other abrasive, making them the ideal choice for shaping and polishing. Let's take a look at an important diamond tool—diamond hand pads.

### History of Diamond Hand Pads

Consisting of a layer of flexible diamonds glued onto a foam handle, the diamond hand pad was introduced ten years ago as the first tool for polishing stone after it had been cut. But although it was relatively simple in design, the diamond hand pad was quite costly because they were:

- Much more expensive than other abrasives
- Rather intolerant of abuse

Since fabricators had previously used silicon carbide for polishing stone, they exerted the same amount of pressure on dia-

mond hand pads, ground too much stone and resulted in short life. Because diamonds were so expensive, these new hand pads were not considered cost-effective shaping and polishing tools. Yet almost everyone who used them recognized their usefulness. After the manufacturers fine-tuned them (and fabricators developed a lighter touch when pressing down on them), diamond hand pads became widely accepted in the industry. What's their ideal use today? Processing touch-ups, areas of difficult accessibility, or small individual jobs. Larger jobs require different tools altogether.

### Types of Hand Pads

Diamond hand pads come in a variety of shapes, but the rectangular 2 1/4" x 4" format is by far the most popular version since it fits so easily into the palm of the hand. The hand pad consists of a diamond section (small islands of diamonds that permit a certain amount of flexibility) that is generally glued onto a foam support. These diamond islands are available in two basic forms:

#### 1. Electroplated Metal-Bond Grits

Electroplated metal-bond grits range from extremely coarse grit sizes such as #30 and #50, to extremely fine sizes such as #600 (or even smaller). The most popular grit sizes for marble are #70, #220, and #400.

As their name implies, metal bonds use a metal coating to hold each individual diamond particle in place. This ensures the best possible retention and effectiveness of every diamond particle.

#### 2. Resin Bond Grits

Resin bond grit sizes range from #600 through #800, #1800, and #3500. Resin-bonded products have no scratching ability of their own, and the resin base only holds the diamonds in place. The diamonds produce successively finer scratch patterns, until these patterns become so small that to the human eye, the surface appears highly polished.

As every fabricator knows, nothing is more frustrating than to

finish a job and then notice scratches still present on the surface. Resin bonds are generally less “aggressive” than electroplated metal bonds. They are more forgiving and therefore do not leave large, undesirable scratches.

### **Sample Applications**

For a typical job that calls for polishing a rough cut granite edge, try this procedure:

1. In succession, use the metal-bonded #70, #120, #220, and #400 grit sizes.
2. Continue by using the resin-bonded #600, #800, #1800, and #3500 grit sizes.

This sequence will produce a glossy finish on almost any stone. When working with marble or granite, an additional buffing sequence will bring out the full gloss of the stone.

For special applications, very fine grit diamond hand pads (down to #8500 and even smaller) or very coarse grit pads are available. For grits finer than #400, the most economical encapsulation method are the resin-bond grits because again, they’re more forgiving than the electroplated metal-bond ones.

### **Important Considerations for Custom Hand Pads**

Manufacturers can deliver a custom solution for every stone-cutting preference and need. When diamond hand pads are tailored for each aspect of a job, manufacturers pay close attention to these important considerations:

#### ***Rigidity***

Rigidity is important to maintain a flat, mirrorlike surface on products such as counter or table tops. Hand pads used for these surfaces are generally made with foam handles and offer the best characteristics of an all-around tool.

#### ***Flexibility***

Flexibility is important to those who polish rounded surfaces such as bullnoses or ogee shapes. Diamond handpad material is available from manufacturers and can be cut into strips of any size. These strips can be fastened with hook-and-loop backing to specially shaped forms which mirror the shape of the finished edge.

#### ***Ruggedness***

Ruggedness is essential for heavy-material removal, such as tile edging and sizing, or even rough work on hard stones. Although for these purposes hand pads are still foam-mounted, they are made on very rigid substrates and the diamond islands are much larger. This allows them to withstand the pressures exerted during greater material removal.

### **Why Water is Essential to Diamond Hand Pads**

For a better finish and to extend the life of the hand pad, be sure to use water while polishing. Although some work can be

done dry, water offers important benefits.

For example, because resin-bonded diamond hand pads are particularly intolerant of heat, water is an essential accompaniment. The water not only rinses away the cuttings (dirty water) from the stone’s surface, it also cools the diamonds and prevents the resin base from overheating.

### **The Power of Orbital Pads**

Any time hand pads are the best tool for the job, orbital pads are the only power alternative that should be considered. Orbital pads are mechanically powered, and therefore offer relief from excessive arm muscle fatigue. The power tool they are attached to should have a “jitterbug” or vibratory type of motion. This is important because if more work is done with one grit than another (because the arm gets tired), the finished stone will not display an even degree of reflectivity, and the workmanship will appear to be poor.

Orbital pads are larger than hand pads and are available in the same grit sizes. They are also available in a wide variety of dimensions to match the power tools being used.

### **Don’t Work Too Hard**

There’s no question a shop can experience solid benefits from the proper use of diamond hand pads. The fabricator should be able to profit by:

- Saving time
- Having more consistent finishes
- Increasing productivity
- Reducing costs (which lead to increased profitability)

The single most important thing to remember when using diamond hand pads is let the diamonds do the work. In other words, don’t treat a diamond hand pad like one made of silicon carbide. Forcing the hand pad to work harder than necessary will only decrease its useful life.



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