

Simple tips for Mosaics with
DiamondCRETE™
www.diamondcrete.net Inc.

Mosaic techniques are as wide and varied as the artists who create them.
Here are a few simple tips to help you get started with confidence.

Supplies needed:

Substrate – the surface on which mosaic pieces are adhered
Tesserae – the decorative items used to create the mosaic design
Cutting or breaking tools – appropriate for the tesserae selected
Adhesives – appropriate for 1) bonding selected tesserae to chosen substrate and
2) the end use of the mosaic – interior or exterior

Other items needed:

Masking tape	Mosaic mesh or adhesive paper (indirect methods only)
Grout (DiamondCRETE™)	Grout sealer (DiamondSEAL™)
Mixing containers	Safety equipment as needed
Gloves	Cleaning supplies - paper towels, rags, water

Select and prepare substrate:

- A. Choose a substrate that will support the weight of the selected tesserae and grout without bowing or flexing. For exterior projects, select waterproof or water resistant materials such as concrete board or backer board. Wooden substrates are better suited for interior projects. Substrates to avoid are materials that flex or warp such as particleboard, some plastics and thin flexible metals. When the substrate warps or flexes, the grout will crack and the tesserae may come loose.
- B. At the very minimum, substrates should be cleaned to allow the adhesive to do its job. Smoother substrates, such as concrete or formica, may require the surface be roughed up a bit to facilitate proper adhesion. Overly absorbent substrates such as terra cotta and wood should be sealed with either a tile sealer, or a mixture of 1 part white glue & 2 parts water. A 'waterproofing' sealer is not recommended for this step as it will likely interfere with the adhesive. Sealing absorbent substrates merely prevents the adhesive and grout from drying too quickly thus preventing cracks in your grout down the road.

Select and prepare tesserae:

- A. Since mosaic designs can be created from a dizzying number of items, the general term for the design elements used is tessera or tesserae (plural.) Choose items that interest you but be mindful of the end use of your project and select water resistant items for exterior projects and pieces of uniform thickness for tabletops and flooring to facilitate a smoother finished surface.
- B. Wearing safety glasses, use the glass cutter, groziers, running pliers, mosaic wheeled cutters or tile beakers to cut the tesserae into pieces of various sizes for your design. It's a good idea to hold a few larger pieces of tesserae in reserve so that when you are nearing the end of your cut-up supply and you need a larger piece, you still have some of the original material to work with.

Select and apply adhesive:

- A. Besides the consideration given to water resistance, adhesives are designed to bond porous objects to porous objects, non-porous objects to non-porous objects, or a combination of the two. Choose an adhesive that is appropriate for bonding the selected tesserae to the selected substrate. If your mosaic is designed for exterior use, select a water resistant adhesive. In cases where the tesserae are transparent, the adhesive selected should be clear when dry. When vitreous materials such as stained glass are used, the adhesive should be flexible when dry with minimal shrinkage to prevent undo stress between the material and the adhesive. Many adhesives have safety precautions so use appropriate ventilation where needed.

- B. For direct mosaics (see notes about indirect mosaics on the following page), apply your adhesive in small workable sections. Adhesive can be applied either directly to the substrate, applied to each piece before placement, or some combination. If you are working on a three-dimensional surface appropriate for PVA glue, consider refrigerating the glue which thickens it and helps prevent pieces from sliding before the glue can grab hold of the piece.
- C. Once all pieces of tesserae are placed, allow the adhesive to dry according to the manufacturer's guidelines.

Select Grout color:

- A. Create several smaller 'test' pieces to assist you in selecting the right color of grout for your project. In general, darker colored grout tends to intensify the design, lighter colors tend to fracture the design, and medium tones tend to blend the colors together. For each grout color being considered gather a scrap of glass or wood about 2" x 2" in size, and some of the remaining pieces of tesserae and glue some of each of the different pieces of tesserae to the scrap. Allow the adhesive to dry.
- B. Wearing gloves, mix a small quantity of DiamondCRETE™ to a fairly thick paste and grout each of the test pieces in the selected colors. Allow the grout to dry.
- C. Once dry, determine which color is best suited for your project. While light, medium, and dark colored grouts each have their advantages and disadvantages, it's always best to experiment on a smaller piece to avoid a bigger disappointment further along in the project.

Project completion:

- A. Mask off any sections of the substrate you do not wish to grout (borders and absorbent tesserae) using masking tape.
- B. Wearing gloves, mix a small quantity of DiamondCRETE™ to a fairly thick paste and grout the project by pressing the paste into the spaces left between the tesserae. DiamondCRETE™ has water reducers in the mix which act as fortifiers and prevent the need for a lot of excess water when mixing. You will notice that DiamondCRETE™ will thin as you work the mixture so use caution when adding water – a spray bottle can be very handy. DiamondCRETE™ sets up very quickly so work in small sections and clean as needed throughout the process. To clean your project, use paper towels or lint free rags and avoid using watered down sponges. The water will wash away much of the creamy cement in the grout and expose the sand in the mixture leaving a grainy surface. Using less water will also reduce the efflorescence (a white film) that forms on the grout during the curing process. Continue grouting in small sections until the mosaic is completed. If you are blending two or more colors, be sure and blend a sufficient quantity of the dry powder before starting so that each smaller batch of grout mixed is consistent in color.
***Important** – DiamondCRETE™ is well suited as a grout for both interior and exterior applications, however, it is not rated for use in underwater mosaics. For underwater mosaics, such as birdbaths or fountains, use a grout and sealer rated for such applications usually found in pool and tile supply stores.
- C. After the DiamondCRETE™ has begun to set, but before it has hardened, remove the masking tape from the borders of the piece so that the grout can be shaped if needed. Allow the grout to dry naturally overnight or longer.
- D. Seal your mosaic with DiamondSEAL™. Sealing your mosaic protects it from staining, retards efflorescence, and prevents the grout from taking on additional moisture.
- E. Install your mosaic and enjoy!

Direct vs. Indirect Mosaics

Tesserae are applied in one of two methods – directly or indirectly. The direct method involves adhering each piece directly to the substrate as described in the previous pages. It is the preferred method for irregular surfaces like concrete statuary, curved surfaces, or small projects. The indirect method, however, is the preferred method for hard-to-reach or large installations because it allows the mosaic to be constructed in sections in the studio, and easily transported to the installation site. It is also the preferred method for projects that require a smoother finished surface. Indirect mosaics involve the use of either back mounted mesh or surface mounted adhesive paper or films.

For back mounted mesh -

To use mosaic mesh, simply lay the mesh on a protected work surface such as waxed paper or similar surface that will resist adhesives. Apply the back of each piece of tessera to the mesh with glue. When all the pieces in the design are assembled and the glue is dry, prepare the substrate by applying an adhesive such as thin-set with a trowel and then setting or placing the mesh in the bed of adhesive. Use a rubber float to evenly tap the design in place. Once the thin-set is dry, the mosaic is ready to be grouted. The mesh is permanently embedded in the design.

For surface mounted papers or films -

Surface mounted adhesive papers and films are applied to the front of the tesserae and are often used in conjunction with a tile grid. The pieces are arranged face up over the pattern to form the mosaic design. The adhesive paper is then adhered, all at once, to the front surface of the tesserae. Once the substrate is prepared with adhesive (like the back mounted mesh application) the design is set in place. Use a rubber float to evenly tap the design in place. When the adhesive is dry, the surface paper is removed and the mosaic is ready to be grouted. Surface mounted papers and films can solve minor thickness variations in tiles by raising the top surface of each piece to the same level and leaving the depth variation on the backside embedded in the adhesive. This method of correcting minor depth variations is called 'floating.'

Variation of the surface mounted papers and films -

The surface mounted method is also the preferred method for creating mosaic garden stones and other smooth surface tiles. The primary difference for this type of project is the lack of traditional adhesive. The pieces are arranged face up over a pattern as described above and the adhesive paper is then adhered, all at once, to the front surface of the tesserae. The assembly is then placed, mounting paper side down in a mold or form and a concrete mixture poured over the back of the design. Once removed from the form, the surface is grouted as in any other mosaic method. The resulting top surface is completely smooth as all of the depth variations are resolved within the concrete substrate. Smaller tabletops and trivets are made using this method as it yields the smoothest possible surface of all the mosaic methods.