

R&D Evaluation Request / Report

DATE: 8/22/08	REQUESTED BY: Chris Metcalf
TECHNICIAN: Jason Romeo	REPORT NAME: Color Mirage Glass Drilling
PRODUCT ID: Color Mirage Glass	
VENDOR: Applied Coatings	

OBJECTIVE:

To determine the ability of Alpha® products to drill clean core holes in Color Mirage Glass. The technician will be looking for quality of the hole, ease of use, repeatability, and the value of using a template.

METHOD OF EVALUATION:

The technician will mount the glass samples to a piece of 5/8" drywall. Laticrete 254 Platinum will be applied to the dry wall with a 1/8" "V" notched trowel. The glass samples will then be laid. This will be allowed to cure for 24 hours according to the manufacturers specifications. The technician will then attempt to drill various sized holes in the glass using Alpha's ® electroplated diamond drill bits. Each size hole will be made freehand, without a template. The technician will then repeat this process with the use of a template. The condition of the holes will then be compared and the quality assessed. The technician will note his findings in this report.

TECHNICAL DATA:



Alpha® AIR-658 Polisher
with center water feed.
3500 RPM (no load)



Color Mirage glass tiles -
Varying thickness
3.12mm - 3.94mm



Alpha® Electroplated
Diamond Drill Bits
(20mm,15mm,10mm,
8mm,4mm)



5/8 - 11 adaptor with drill bit
attached



Laticrete 254 Platinum -
Thin set



Thin set applied to the dry wall
with a 1/8" "V" notched trowel



Color Mirage Glass Tiles set
on dry wall



Wooden Template

The technician began by trying to make the holes without the use of a template. He started by holding the bit at a 45 degree angle to the stone to begin the hole. As the bit began to cut, the technician slowly raised the bit to 90 degrees to finish the hole. This method successfully made the holes and the technician could drill the hole right on the mark. This method produced some chipping on the top and bottom of the glass. The electroplated bits cut through the glass quickly, but removed some of the backing material. The technician tried this method for all bit sizes and the results were universal throughout.



Starting the bit at 45 Degrees and slowly raising it to 90 degrees to complete the hole



This method produced some chipping of the glass and removal of the backing material.



The technician then tried to start the hole in the 90 degree position. He held the bit in this position for the duration of the cut. This produced a much cleaner hole with less chipping of the tile than the first method. This method also removed less of the backing material. This method can be used to produce clean holes quickly. The technician found that it was more difficult to hit the mark for precise placement of the hole using this method. When the bit first makes contact with the glass, it wants to walk until it cuts into the glass. It takes a bit of practice, but this method can be used to produce quality holes in the correct position. Holes should not be made near the edge of the tile with this method. This may crack the glass. The technician tried this method for all bit sizes and the results were universal throughout.



Starting in the 90 degree position



Cleaner looking holes with less chipping and backing removal



Many holes in one tile using this method. Note the cracked corner.

The technician then made a template. The template was produced by drilling the appropriate sized holes in a piece of 1/2" plywood. The template was used to produce the different sized holes in the glass. This method proved to be the most reliable and produced the cleanest, straightest, and virtually chip free holes. The template was placed over the mark for the hole. The drill bit was then placed in the hole of the template. It was held steady until the bit drilled through the glass. The template was then removed and the hole evaluated. This proved to be the best method for drilling holes in the Color Mirage Glass.



Making holes with the use of a template



Clean and chip free hole made with a template



Even while using a template, the user must be careful near the edge of the material.

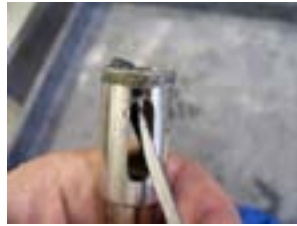


20mm hole and 4mm holes made with the use of a template.

It is important to note that all the cuts were made wet. The technician used the Alpha® AIR-658 polisher with the water valve in the completely open position. The removed material sometimes stayed in the drill bit. This needs to be removed between holes to maintain the proper water flow to the diamonds. The technician used a small screwdriver to gently remove the remaining material. It is important not to damage the cutting edge of the drill bit during this operation.



The removed material remains in the drill bit.



Gently removing the remaining material with a screwdriver.



The drill bit is ready to make the next hole.



Material removed from the drill bit.

Conclusion:

This testing proves that Alpha® products can be used to successfully drill holes in Color Mirage Glass. The use of a template is recommended for the cleanest, most precise hole making. It is possible to make the holes “freehand” where the use of a template is not practical. I found that the holes can be made very quickly. It is recommended to apply just a little bit of pressure and let the drill bit do the work. If excessive pressure is used to force the bit through the glass, chipping and cracking of the glass may occur. It is also important to hold the bit in the same position throughout the cut. It is not necessary to rock or rotate the bit during the drilling process. Doing this will chip and crack the glass.

I made 20 holes with each sized bit, without any negligible loss in cutting ability. Upon further investigation, I found each bit to show some minor wear. This included slight loss of diamonds on the cutting edge and some markings on the body of the bit. Neither of these conditions seemed to affect the performance of the bits dramatically. Use of water while making these holes is critical to them reaching their full potential.

The Alpha® AIR-658 was used for the testing because of its 3500 RPM speed and its center water feed. This tool is recommended for this application but may not be able to be used on location due to the need for supplied air. We can also recommend the Alpha® VSP-120 variable speed polisher because of its RPM range and center water feed. This tool is electrically powered and can be used anywhere a 110V power supply is available.

Alpha® products are a great solution to making holes in installed Color Mirage Glass. The electroplated diamond core bits come in many sizes and can be used to complete most drilling operations. With a little practice and care the job of making holes in the glass can be easily and safely completed.