

## What's Wrong with This Shotcrete Material? It's Not Bonding!

### It was Good Yesterday but Today It's Not Sticking

By Michael Cotter

**B**efore you automatically call to scream at the manufacturer, you may want to check a few things that you, as the contractor, may be doing wrong in your daily operations, regardless if you are using the wet or dry method of shotcrete placement.

First, let's begin with the water. Check to make sure it is fresh and from a potable source. You may want to check the temperature of the water as this will definitely affect the mixture. Next, check all the fluid levels on the compressor, especially the air end oil. When you start the compressor, make sure to build to operating temperatures and inspect all lines for leaks. Bleed the moisture by slowly opening a valve. Check to make sure the compressor is not blowing oil by holding an 8 x 11 in. (203.2 x 279.4 mm) piece of cardboard in front of the valve and slowly turning the air three quarters of the way on with the air stream directed at the cardboard. If you notice an oily substance on the cardboard, oil is entering the air stream, which is ultimately entering the shotcrete mixture at either the dry gun or the nozzle on the wet mixture.

What happened? What did I do? What happened is either there is a collapsed oil/air separator or it is in need of replacement. The life of the oil separator element is dependent upon the operating environment (for example, dust and soot) and should be replaced every 12 months or 2000 hours, per the manufacturer's recommendation. Remember, most compressor manufacturers recommend the oil/water separator be replaced every 500 to 1000 hours under normal

working conditions. Shotcreters, however, typically don't work under normal conditions. We run hard. We run the equipment hard. That is the nature of the business.

A few tips to shut down the compressor are 1) do not allow the employees to use the compressed air to blow themselves off at the end of the shift; 2) do not run the compressor with valve(s) open to the atmosphere; 3) do not shut the compressor off with the valve(s) open; and 4) do not shut the compressor off and then open the valve(s) to bleed the air. Allow the compressor to bleed the air itself and slowly.

If you notice sheen in the shotcrete, it is probably from the delivery system. If you noticed this problem before and overlooked it but now are noticing a pattern of "bad" material, do the industry a favor. Investigate how long you've had this problem. Check your work by sounding out the repair area and removing all unsound concrete and properly preparing the surface prior to replacement. Develop a toolbox talk from the compressor manufacturer's equipment manual. Proper training on equipment will avoid many potential shotcrete failures.



*Michael Cotter is a former member of the Gunitite Contractor's Association, Charter Member and Treasurer of the American Shotcrete Association, and an ACI-certified nozzleman. He is involved*

*in the shotcrete industry, both wet- and dry-mix processes. Cotter was instrumental in helping develop the use of hydrodemolition for overhead and vertical locations in the early 1980s. Cotter is a consultant currently promoting shotcrete in the rail and road transportation arenas. His motto is "There is enough concrete to repair without the need to do it over." Cotter can be reached at [mpccotter@aol.com](mailto:mpccotter@aol.com).*