

## Homegrown Innovation in Swimming Pool Dry-Mix Shotcrete Equipment

By Ron Lacher

I have always enjoyed our ASA President Chris Zynda's articles, where he's mentioned his past experiences working on a gunite crew in the swimming pool industry. Chris had many notable experiences that he has talked about, such as regularly heading for the yard well before dawn, long days, no lights or breaks on the equipment trailer, tie-wire holding things together, and much more. Chris got into the swimming pool industry in the late 1960s, while my swimming pool construction experience started a few years later in the mid 1970s. In those days, I was a pool contractor overseeing the project, so I didn't have Chris's notable experiences or his knowledge of the gunite process.

Like Chris, when I first started in this industry, I saw a lot of tie-wire holding equipment together. But I also saw a lot of inventiveness and resourcefulness on the part of a number of gunite contractors and pool construction companies. That inventiveness was usually because someone had a new idea that could hopefully produce a better mixture or perhaps increase production or improve economy.

Several months ago, I assisted Chris Zynda with an ACI Nozzleman Certification session at Woody Douglas Gunite in Ontario, CA. I've known Woody since my first days in pool construction when he was a foreman shooting my pools for another gunite company. The nozzleman certification was done at Woody's yard in San Bernardino, CA, where he stores both his running and nonrunning equipment. Woody has acquired a wide range of dry-mix equipment over the years. The nozzleman certification gave me a chance to have a close look at three or four different gunite machines. Today, most of the shotcrete companies I've observed are running equipment that was built by an equipment manufacturer. What was so interesting to me was that all but one of the gunite machines in Woody's yard were designed and built by the companies that actually use the equipment and not from an equipment manufacturer.

The popularity of these homegrown gunite machines (Fig. 1) in past years was likely due to the prevalence in some areas of street mixing gunite materials for swimming pool construction. Street mixing is the dumping of bulk sand in the street, which is then loaded into the gunite machine along with the correct proportion of either bulk or bagged cement. Today, because of environmental protection regulations in many areas, it is very difficult to legally dump sand onto the street. Because of these environmental laws, as well as equipment weight restrictions, street mixing is becoming more difficult and out of favor.

Woody Douglas entered the swimming pool gunite industry around 1963 and formed his own company in the early 1980s. Because of his prior history with gunite before forming his company, he was able to tell me a little about the history of some of his acquired pieces of equipment, which were built after the late 1960s. The dates or other information in this article may not be 100% accurate. The intent of this article is to show some examples of the creativity of several of the early gunite equipment innovators rather than be



Fig. 1: Homegrown paddle mixer from the 1970s

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concerned about the accuracy of the dates. I'm sure there were similar innovations in the old hopper-fed barrel mixers used in the 1950s and early 1960s; however, I haven't run across any equipment from that era sitting in bone yards or anyone able to tell me about the equipment used prior to the mid-1960s.

Woody first gave me a quick tour of a couple of old paddle mixer rigs that were built by Don Nourse of Enterprise Gunitite Corporation. These gunitite machines were likely built in the early to mid-1970s and acquired by Woody Douglas when Enterprise closed its doors. These rigs were in use and producing material primarily for swimming pool construction until they were retired a couple of years ago.

Gunitite paddle mixers have large rotating paddles within one or more drums, much like a plaster mixer (refer to Fig. 2). These are believed to do a better job than augers for mixing the cement and sand. These paddle mixer gunitite machines built by Don Nourse had both a lower mixing drum and an upper mixing drum fed by an elevator from the lower mixer. These rigs were driven by very heavy-duty hydraulic motors; because of that, they were very reliable and able to produce a quality mixture. Because of the weight of the mixer drums and the heavy-duty hydraulics, however, these rigs were overweight and became problematic as truck weight restrictions became more prevalent. It got to the point where hoses, planks, and all materials had to be removed from the drums and hopper to maintain these rigs within the legal weight restrictions. Because of the weight restriction issues, these rigs are now used for spare parts but could be put back in service if the need ever arises.

Woody also had another unique gunitite machine sitting in his yard that was built by Anthony Pools in the late 1960s. This rig is also a paddle mixer, but it is unique in that it is an all-electric gunitite machine (refer to Fig. 3 and 4). All of the paddles, elevators, and other equipment are operated by heavy-duty electric motors rather than hydraulics. Along with a compressor, a 45KVA generator was also mounted on the truck that towed the rig. The electrical control systems all appeared to be very sophisticated and reliable considering their late 1960s origin. As an example, for safety, all of the operator controls were low-voltage micro-switches that operated high-voltage relays, which switched the electric drive motors on and off. According to Woody, most of the electric motors on the rig are original, which is a testament to the planning and design that went into building the rig. Although the rig hasn't been out of the yard in 6 months due



Fig. 2: View of the paddle mixer showing the double chamber gun



Fig. 3: All-electric paddle mixer from the late 1960s



Fig. 4: Electrical control panel on rig shown in Fig. 3

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*Fig. 5: Contractor-built gunite rig using auger mixing*



*Fig. 6: Self-contained gunite rig*



*Fig. 7: Custom-built mobile mixer can deliver 17 tons (15.4 metric tons) of dry-mix material*



*Fig. 8: Rig with mobile mixer has over 40 ft (12.2 m) of auger mixing*

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to the slow economy, its systems are started regularly to keep batteries charged and its systems operational.

In addition to the paddle mixer gunite machines, Woody had also acquired another homegrown gunite rig that was built in the mid-1980s. This rig looked somewhat similar to more contemporary gunite machines built by an equipment manufacturer (Fig. 5). Mixing is done by an auger rather than paddles within a drum.

When we talk about gunite equipment innovators, at the top of the list would be Dean Norton of Arco Gunite in Orange, CA. Although I've also known Dean since the late 1970s when Arco Gunite was one of my regular subcontractors, Dean's career in gunite goes back to 1955. In the mid-1970s, Dean recognized the shortcomings of the existing gunite machines he had used and set out to design and build his own rig based on what he believed to be the needs of the Southern California market place. The end result was a self-contained rig shown in Fig. 6.

I've already mentioned the environmental and weight restriction regulations that will soon make street mixing an operation from the past. Dean has anticipated these changes and is now using mobile mixers he has designed and built that can transport material for up to 17 tons (15.4 metric tons) of gunite to the job site without dumping sand in the street (Fig. 7). Dean's fleet of mobile mixers is designed to feed material directly into his next generation, custom-built gunite machine. Dean proudly talks about the nearly 40 ft (12.2 m) of augers that can provide a mixture of the highest possible strength (Fig. 8).



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**Tom Norman, ASA member and Chair of ASA's Pool & Recreational Shotcrete Committee, wants your input. Your comments, suggestions, and the topics you'd like to see covered are welcome. Perhaps you'd like to become a contributing author to Pool & Recreational Shotcrete Corner. Norman and the ASA staff encourage you to contact ASA with your questions and comments at: [info@shotcrete.org](mailto:info@shotcrete.org).**