

## **Options for Crack Repair**

By Lance Anderson  
Owner  
Anderson Manufacturing Co., Inc.  
St. Paul, MN 55117  
landerson@leaktools.com

The past several years of weak pool construction activity has highlighted the value of identifying alternative revenue sources for the pool professional. Finding and fixing leaks in existing swimming pools has become an area of great interest for diversification. The area provides many options for specialization and many opportunities for generating revenue. One, area that offers outstanding profit opportunity is crack repair in concrete pool shells.

When faced with a leaking gunite pool crack, you and your customer are faced with several options for repair: simple topical repairs that can be made while the pool is filled, more permanent crack injections, or extensive concrete removal and structural re-engineering. The choice of which of these repair options to pursue should be based upon: the severity of the crack, the permanence of the repair desired, and the customer's budget.

### **What's the Problem?**

Cracks can be caused by a number of situations; some are the result of pool workmanship or materials used at the time of construction. These types of cracks usually show up soon after construction and are generally not the responsibility of the leak professional.

Cracks that develop on older pools and result in water loss however are a different story. A first step in any crack repair job is to diligently attempt to understand the conditions that lead to the problem in the first place.

If the crack a result of some one time event such as an extremely cold winter, or the fact that the pool was left un-filled for some length of time one would not expect continued movement. However, if the crack is the result of re-occurring ground movement such as the case in soils that expand when moist and shrink when dry, continued movement should be anticipated and a repair must take this into consideration. The most serious problems result from ground conditions that are being continuously undermined and are expected to continue degrading. While some of these problems can be solved with tools and techniques available to the average leak professional, situations involving erosion, or "slope creep" (where a pool may be built on a hillside and the supporting soil settles downhill) or will be generally be best handled by a structural or soil engineer.

### **Sometimes a Band-aid is all that's needed**

The simplest and least expensive type of crack repair is a topical patch to the surface of the crack. Such repairs can be made with a variety of epoxies and sealants many of

which can be applied underwater. Epoxy putty is a two part material that is kneaded together by hand to form a clay-like material that can be worked into cracks with your fingers. Epoxy putty can be applied underwater and offers the advantage of being easy to match to the surface of the pool, but since it is non-flexible when cured future movement of the crack will undermine the repair. Epoxy repairs often require attention on an annual basis. Rubber or silicone based sealants can also be used for simple surface repairs. While some of these can be used underwater the most common use of such sealants involves draining the pool, v-cutting the crack, and applying a bead of sealant to the bottom of the “v.” Plaster repair compounds are then used to fill the remainder of the v and match the surface of the pool. Such repairs are especially useful for hairline cracks that are too small to accept “fuller-bodied” putty.

While surface repairs may be adequate, and certainly will be the cheapest option for your customer, a better repair is possible if the entire depth of the crack is filled and sealed with Epoxy or Urethane. Low-pressure Crack Injection methods provide such a solution and fit the lucrative “middle-ground” option that gives the customer a lasting repair but does not involve extensive and expensive modifications to the concrete.

### **Day Surgery**

Crack Injection will require that the pool is drained and the surface on each side of the crack is dry. Special injection ports are adhered to the surface of the pool over the top of the crack at 12-18” intervals. The crack is then covered with the same epoxy that is used to adhere these ports to the pool surface. This “Surface-Seal” epoxy closes the crack to prevent the injected sealant material from draining back into the pool. Once the Surface Epoxy has cured injectable urethane foam is forced through the injection ports into the crack using a special dual cartridge gun that maintains a constant pressure of apx. 40 psi. This constant pressure and the low viscosity of the injection material before it cures ensures complete penetration of the crack all the way through the pool shell. The foam then expands (up to 7 times it’s volume) filling not only the crack but also any voids behind the pool shell. (Injectable epoxy can also be used for this step but may require much more material and may not completely fill the crack). After the foam has cured the ports and surface seal epoxy are removed with a portable grinding disc, the crack is v-cut, and a cosmetic layer of plaster repair compound is used to fill the v.

While Low pressure Injection allows for virtually permanent repairs for cracks that result from one time or re-occurring events, the system can also be adapted to provide some benefit for more serious problems. In situations where future crack expansion is anticipated the best way to spread this force over a wider area is to install staples or “stiches” across the crack at 8” to 12” intervals. Staples are made of high tensile strength material such as rebar, stainless steel, or carbon fiber. These staples are imbedded into the concrete (below the plaster surface) with special epoxy before the injection process. The staples and epoxy are covered with the same plaster repair compound used to fill the v-cut of the crack.

Once the pool is drained a basic 10-15’ crack injection repair can generally be completed in about a half a day. The staple process will add another ½ day. Since the repair will

last much longer than a surface repair however, pricing is generally based on the job, and set at what would normally generate more than what a normal hourly charges would.

Another common structural leak can that can also be fixed with injectable urethane foam is the leak that often develops between the skimmer throat and the shell of the pool. These leaks are notoriously prone to being repaired with putty that must be replaced annually. By lowering the water level of the pool below the skimmer opening and injecting expandable foam through a hole drilled into the bottom of the throat, any void around the skimmer body is filled and the leak is permanently sealed from the backside. Such a repair, which is more permanent than putty but less involved than a complete skimmer replacement provides a profitable yet affordable alternative to the service technician and pool owner.

### **Calling in a Specialist**

Always keep in mind that cracks can be indicators of more serious problems. If you are new to crack repair, don't be hesitant to call on a builder or structural engineer with more experience to get a second opinion on weather the crack is easily repairable or not. As you become more familiar with the common types of cracks that are characteristic of your area you will be better able to suggest and deliver effective repair solutions.

Hopefully, this information will help you add capabilities to your leak location and repair activities and provide value to your customers.