Indiana State Department of Health
Environmental Health

HOW TO SHOCK THE POOL
(CHLORINATE TO BREAKPOINT)

When you start to smell "chlorine", what you are really smelling are chloramines. Chloramines are chemical compounds formed by chlorine combining with swimmer wastes such as sweat, urine, body oil, etc. Chloramines are non-effective as a disinfectant and will cause eye and skin irritation.

The chloramine level is calculated by subtracting the free chlorine from the total chlorine in the pool/spa water. Pool/spa water must be tested for combined level at least twice a week. Although most courses recommend the level not to exceed .2 ppm, we recommend that the level not exceed .5 ppm (due to the availability of reasonably priced test kits). The average frequency of shocking is 2-3 weeks for an indoor pool and 7-10 days for an outdoor pool. However, high bather loads will result in more frequent superchlorination.

Note: Pools using bromine as a sanitizer must also perform breakpoint superchlorination using chlorine, as bromine is not available in a form for this procedure. (bromine for pools is a compound of bromine and chlorine) Like chlorine, bromine combines with organic impurities to form combined bromine and bromamines.

Shocking the Pool

STEP 1: Determine the ppm of free available chlorine **(FAC)**

STEP 2: Determine the ppm of total available chlorine **(TAC)**

STEP 3: Determine the ppm of combined available chlorine **(CAC)** or chloramines using this formula:

TAC – FAC = CAC

FOR EXAMPLE:

TAC (2.0ppm) - FAC (1.5ppm) = .5ppm (CAC) or
TAC (3.0ppm) – FAC (2.0ppm)= 1.0ppm (CAC)

- **Steps 1-3 must be done using a DPD test, using the test kit instructions.**

STEP 4: Determine the breakpoint factor using this formula:

CAC x 10 = breakpoint factor (in ppm)

This is the level, in ppm, of chlorine needed to reach "breakpoint"

STEP 5: Identify the type of chlorine to be used for "shocking"

Stabilized chlorine compounds, such as Sodium Dichlor Granular Chlorine or Sodium Trichlor Granular Chlorine may not be used for "shocking" because the permitted level of cyanuric acid would be exeeded over the season. It also would cause the water to have elevated chlorine levels for days.

STEP 6: Plug the breakpoint factor into the right formula:

⇨ **Calcium Hypchlorite .125 x breakpoint factor x pool volume / 10,000 = pounds to add**

⇨ **Sodium Hypochlorite .1016 x breakpoint factor x pool volume / 10,000 = gallons to add**

⇨ **Lithium Hypochlorite .250 x breakpoint factor x pool volume /10,000 = pounds to add**

Note "/" *means divided by.*

FOR EXAMPLE:

Calcium Hypochlorite will be used, CAC is .5, therefore the breakpoint factor is 5 (CAC x 10), the pool volume is 100,000 gallons

.125 x 5 x 100,000 /10,000 = 6.25 pounds of calcium hypochlorite must be added to the pool

NON-CHLORINE OXIDIZERS

Non-chlorine oxidizers may be used to "shock" a pool, but the pool will still have to be superchlorinated periodically with a chlorine compound to kill off the bacteria that become resistant to constant exposure to low levels of disinfectant (chlorine and bromine). An advantage to using a non-chlorine oxidizer is the shut down may be as little as one half-hour. These products will oxidize or destroy ammonia, nitrogen and some swimmer waste, but will not kill bacteria or algae. Listed below is the active ingredient used in non-chlorine oxidizers:

- Potassium monopersulfate

  Note that the use of potassium monopersulfate will result in false readings of chlorine for up to 6 hours as it oxidizes the iodide in the reagent as if it were combined chlorine. There is a reagent available to correct this.