



## Certified Pool/Spa Operator® Course Pool Calculations

### AMOUNT CONVERSIONS

- a) Ounces to Pounds
- b) Fluid Ounces to Gallons

Ounces  $\div$  16 = Pounds  
Fluid Ounces  $\div$  128 = Gallons

### DISTANCE CONVERSIONS

- a) Yards to Feet
- b) Meters to Feet

Yards X 3 = Feet  
Meters X 3.28 = Feet

### SURFACE AREA

- a) Rectangle or Square
- b) Circle

Length X Width = Surface Area in Sq. Ft.  
Radius X Radius X 3.14 = Surface Area in Sq. Ft.

### AVERAGE DEPTH

For constant slope bottom pools

Shallow depth + deep depth  $\div$  2 = Average depth

### POOL VOLUME

- a) Rectangle or Square
- b) Circle

Surface Area (SA) X Depth (D) X 7.5 = Gallons of water  
Surface Area (SA) X Depth (D) X 7.5 = Gallons of water

### GALLONS LOST IN ONE INCH

Surface Area (SA) X 0.0833 (D) X 7.5 = Gallons of water

### CALCULATING COMBINED CHLORINE (CHLORAMINES)

Total Chlorine – Free Chlorine = Combined Chlorine (Chloramines)

### TURNOVER RATE

Pool Volume  $\div$  Flow Rate  $\div$  60 = Turnover Rate (TOR) in hours

### FLOW RATE REQUIRED FOR TURNOVER RATE

Pool Volume  $\div$  Turnover Rate  $\div$  60 = Flow Rate in gpm (gallons per minute)

### FLOW RATE BASED ON FILTER SIZE AND FILTERING RATE

Filter Surface Area X Filtering Rate = Flow rate in gallons per minute (GPM)

### FILTER SIZE REQUIRED (FILTER SURFACE AREA)

Flow Rate  $\div$  Filter Media Rate (FMR) = Square feet of filter surface area required

### SPA WATER DUMPING

Recommended: Dump when Total Dissolved Solids (TDS) rises 1500 ppm above start up reading  
OR:

Spa Volume  $\div$  3  $\div$  Avg. # of users daily = Number of days until water should be dumped

### HEATER SIZING

Volume x 8.33 x Degrees raised (change) = BTU's needed to achieve temperature rise

### TOTAL DYNAMIC HEAD

Multiply Pump PRESSURE gauge reading by 2.31 = feet of head on pressure side

Multiply Pump VACUUM gauge reading by 1.13 = feet of head on vacuum side

ADD THESE TWO RESULTS TOGETHER; RESULT IS TOTAL DYNAMIC HEAD OF SYSTEM

