

Summary of Results of all Pool Evaporation Rate Studies
Improved Pool Evaporation Rate Equation

I. INDOOR AND OUTDOOR POOLS

Evaporation Rates - Quiet Pool

$$W_Q = \frac{(A_P)(C_1 + C_2 v)}{Y} (P_W - P_{DP})$$

Where:

W_Q = evaporation rate of water, lb/hr.

A_P = area of pool surface, ft^2 .

C_1 = 69.4 BTU/(h· ft^2)·in.Hg.

C_2 = 30.8 BTU/(Mi·(ft^2)·in.Hg.)

v = air velocity over water surface, MPH.

Y = latent heat required to change water vapor at surface water temperature, BTU/lb

P_{DP} = saturation pressure at room air dewpoint, in.Hg.

P_W = saturation vapor pressure taken at the surface water temperature, in.Hg.

Evaporation Rates - Active Pool

$$W_A = W_Q \times AF$$

Where:

W_A = evaporation rate of water for an active pool, lb/hr.

W_Q = evaporation rate of water in an inactive pool, lb/hr

Indoor Pool: $AF = 1.04 + .046 \times C$

Outdoor Pool: $AF = 1.08 + .039 \times C$

Where C = Number of swimmers per 100 square feet of pool area

1. Jones, Smith, and Löf, "Measurement and Analysis of Evaporation from an Inactive Outdoor Swimming Pool", Proceedings of the 1993 Annual Conference of the American Solar Energy Society, Washington D.C., April 1993.
2. Jones, R., Smith, C. and Löf, G., "Measurement and Analysis of Evaporation From an Inactive Outdoor Swimming Pool", Solar Energy, 1994, vol. 53, no. 1, p.3.
3. Smith, Jones, and Löf, "Energy Requirements and Potential Savings for Heated Indoor Swimming Pools", American Society of Heating, Refrigeration, and Air Conditioning Engineers Transactions: Symposia DE-93-12-3, Denver, June 1993.
4. Smith, Jones, and Löf, "Rates of Evaporation from Swimming Pools in Active Use", American Society of Heating, Refrigeration, and Air Conditioning Engineers Transactions 1998, V. 104: Research #4146, pg. 514, Atlanta.