Evaporation Report

Review of performance of Plastipack's products in terms of evaporation prevention

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GeoBubble™

With GeoBubble™ Technology

Summary of results by

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Introduction

A Plastipack bubble pool cover will eliminate water loss through evaporation by acting as a barrier between the water surface and surrounding air. Tests on the effectiveness of this product in evaporation prevention were carried out during the summer of 2006. An example of test results is given in this report.

Principle factors that affect evaporation rates from pools

- **Pool surface area**

The bigger the pool, the more surface area, therefore the volume of water lost through evaporation is greater.

- **Water and air (ambient) temperature**

Generally, the greater the difference between water and air temperatures, the higher the evaporation rate is from a water surface. Evaporation rates for a heated pool will be significantly higher than for an unheated pool.

- **Humidity**

The drier the air is, the greater the evaporation rate. In very humid conditions less evaporation occurs.

- **Wind**

The final and very significant factor for outdoor pools is wind. Even a small increase in wind velocity can increase rates of evaporation significantly.

Correct installation of cover to ensure water savings

It is important that a pool cover is fitted correctly to assure maximum prevention of evaporation. Plastipack Ltd provides information on water savings, installation and product care advice sheets for their customers to pass on to the end users. A synopsis of the installation advice given follows below:

This advice is relevant for covers that are not hemmed with a re-enforced edging.

- Ensure the water level is correct.
- Carefully un-pack the cover and lay on the water, bubble side down, smooth side facing upwards.
- Trim the cover with a pair of scissors to fit snugly around the pool wall.
- Remember not to cut off too much in one go, as it is possible to pull the cover away from the opposite wall while cutting thus ending up with a cover too small.
- Cut around pool ladders ensuring rounded corners rather than square, as a right angle cut into the cover will produce a weak point that could tear. Alternatively fit ladder hinges that will lift the ladder away from the pool cover.

All advice sheets are available at www.plastipack.co.uk

Summary of test method

Two unheated tanks were used in this test, one as control (no pool cover) and one fitted with a 400 µm Standard Light Blue cover using the installation method described above.

The tank sizes were 0.985 m x 1.48 m x 0.49 m depth. The water depth used was 0.435 m

The tanks were situated outdoors in UK[1] summer weather conditions for 8 day/night cycles. Water depth measurements were taken to calculate the volume of water lost through evaporation.

Water temperature measurements were data logged using temperature probes situated in the tanks. Relative humidity and air velocity measurements were recorded using data loggers also.

Results

Test Day	Cover	Tank Width (cm)	Tank Length (cm)	Water Depth (cm)	Volume (l)	Water Loss (l)	Average Loss (l/day)	Average Loss (l/m^2/day)
	Light Blue 400 µm							
1		98.5	148	43.5	634.14			
4		98.5	148	43.5	634.14			
7		98.5	148	43.5	634.14			
8		98.5	148	43.5	634.14			
					Totals	**0**	**0**	**0**
	No cover (Control)							
1		98.5	148	43.5	634.14			
4		98.5	148	42.5	619.57	14.58		
7		98.5	148	41.1	599.16	20.41		
8		98.5	148	40.8	594.78	4.37		
					Totals	**39.36**	**4.92**	**3.28**

Test Conditions	Min.	Max.	Mean.
Ambient Temperature Range ° C	18.29	25.21	21.51
Water Surface Temperature: ° C			
Covered tank	18.6	26.97	22.50
Uncovered tank (Control)	14.82	25.14	19.87
Wind Velocity m/s	0	5.5	2.75
Relative Humidity %	20.01	93.62	61.914

The results show that there was **no water loss from the covered tank**, whereas **39.36 litres were lost through evaporation from the uncovered control tank** over the duration of the test. This equates to **6.21 %** of original water volume. On calculation, the maximum fluctuation due to thermal expansion of water was 0.232 mm. This is less than 1% of the change in height due to evaporation from the uncovered tank.

Similar results would be expected from other varieties of this product.

Conclusions

This loss equals **4.92 litres of water per day**, or **3.28 litres per square metre of water surface per day.**

For a pool 10 m x 5 m, with a surface area of 50 m^2, this equates to **164 litres per day** lost through evaporation or **59, 860 litres per year.** In reality, weather conditions change and a pool cover is not in use 24 hours/ day in the summer months.

If a pool is covered for 14 hours per day for 6 months of the year, and covered for 24 hours during the other 6 months, it is reasonable to assume from these observations that **47,379 litres of water can be saved per year.**