



EVALUATION REPORT

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Report Number: 2295-21879

Report Issued: June 2, 2021

Project No.: 35996

Client: KD Enterprises
4348 Waialae Ave 315
Honolulu, HI 96816

Source of Samples: Samples were sent to IAPMO R&T Lab from KD Enterprises and received in good condition on 04/13/2021.

Location of Testing: IAPMO R&T Lab, 5001 East Philadelphia Street, Ontario CA 91761

Dates of Evaluation: May 14-May 24, 2021

Product Description: Water conditioning device model 4" WSPS (HDC)

Primary Standard: Custom testing procedure outlined below

Scope of Evaluation: The purpose of the testing was to determine what effect the samples described above have on reducing the rate of evaporation out of the pool.

Conclusion: The pool with the water conditioning device installed had an average of 23% less water loss than the control pool in a period of 9 days.

Report Status: COMPLETE

Reviewed By,

Sal Aridi - Director

All testing and sample preparation for this report was performed under the continuous, direct supervision of IAPMO R&T Lab, unless otherwise stated. The statement of compliance is based on the test results compared to the standard specifications without considering measurement uncertainty. The observations, test results and conclusions in this report apply only to the specific samples tested and are not indicative of the quality or performance of similar or identical products. Only the Client shown above is authorized to copy or distribute the report, and then only in its entirety. Any use of the IAPMO R&T Lab name for the sale or advertisement of the tested material, product or service must first be approved in writing by IAPMO R&T Lab.



Objective: to quantify the amount of water loss in an HDC treated pool versus a pool that is not HDC treated.

Setup: For this test two identical pools pool 1 (with the HDC device installed) had 8155 gallons of water and pool 2 (Control) had 8460 gallons of water were set up side-by-side fitted with the same size cartridge filter (Jacuzzi JCA100 and Hayward CC1000) and ran at the same flow rate of 60 gallons per minute (Figures 1-3) . The plumbing was setup so that there are 2 inlets and 3 returns all on 2-inch pipes (Figure 3). Both pools were maintained at the same parameters PH, alkalinity, hardness, and temperature. The only variable was the amount of chlorine (12.5% Sodium Hypochlorite Figure 4) added to each pool to maintain it at a target of three parts per million free available chlorine (Table 5).

The water drop measurements were recorded at four points around the perimeter of each pool at 90° increments (Figure 1). These values are recorded in table 1. The difference between successive dates of measurement at each location is recorded in table 2. Also in table 2 the overall difference in the drop from the the first date to the last date is recorded as 5-24 total. Then the difference in the drop at each point between Pool 1 and Pool 2 was calculated (P2-P1), this difference shows that there was a shift at point 4 in Pool 1 of 0.125 inches. So that difference was backed out of the point 1 drop (5-24 Total adjusted for pool shift) for a net drop of 1.5 inches at point 1. The volumetric change is P1 and P2 was calculated in table 3.



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Point of Measure	P1				P2			
	1	2	3	4	1	2	3	4
15-May	1.875	5.125	9.5	4.625	2	6.375	9.75	5.5
17-May	2.875	5.625	10	5.125	2.5	6.975	10.25	5.78
19-May	2.25	6.125	10.25	5.25	2.75	7.125	10.5	6.125
21-May	2.625	6.25	10.625	5.75	3.125	7.5	10.875	6.5
23-May	3.5	6.875	11.125	6.25	3.635	8.062	11.25	7
24-May	3.25	7	11.25	6.5	3.875	8.25	11.5	7.25

Table 1 – Measured Water Drop in inches from a Fixed Point

Point of Measure	P1				P2			
	1	2	3	4	1	2	3	4
Change (from previous measurement)								
17-May	1	0.5	0.5	0.5	0.5	0.6	0.5	0.28
19-May	-0.625	0.5	0.25	0.125	0.25	0.15	0.25	0.345
21-May	0.375	0.125	0.375	0.5	0.375	0.375	0.375	0.375
23-May	0.875	0.625	0.5	0.5	0.51	0.562	0.375	0.5
24-May	-0.25	0.125	0.125	0.25	0.24	0.188	0.25	0.25
5-24 Total (May 24-May 17)	1.375	1.875	1.75	1.875	1.875	1.875	1.75	1.75
P2-P1 (from 5-24 total)	0.5	0	0	-0.125				
5-24 Total ADJUSTED FOR POOL SHIFT	{1.375-(-0.125)} =1.5				1.875			

Table 2- Drop Changes from Previous Measurement (in Table 1)

Calculations:

		Calculation
AREA OF P1 inches ²	42822	Top Surface
CHANGE IN P1 VOL inches ³	64233	42822 x 1.5
GAL LOST FROM P1	278	64533 in ³ /231 (in ³ /gal)
AREA OF P2 inches ²	44675	Top Surface
CHANGE IN P2 VOL inches ³	83766	44675 x 1.875
GAL LOST FROM P2	363	83766 in ³ /231 (in ³ /gal)
Vol Change	23%	1-(278/363)

Table 3- Calculations for Percentage Difference



Figure 1 – Two Pools Layout



Figure 2- Device Under Test

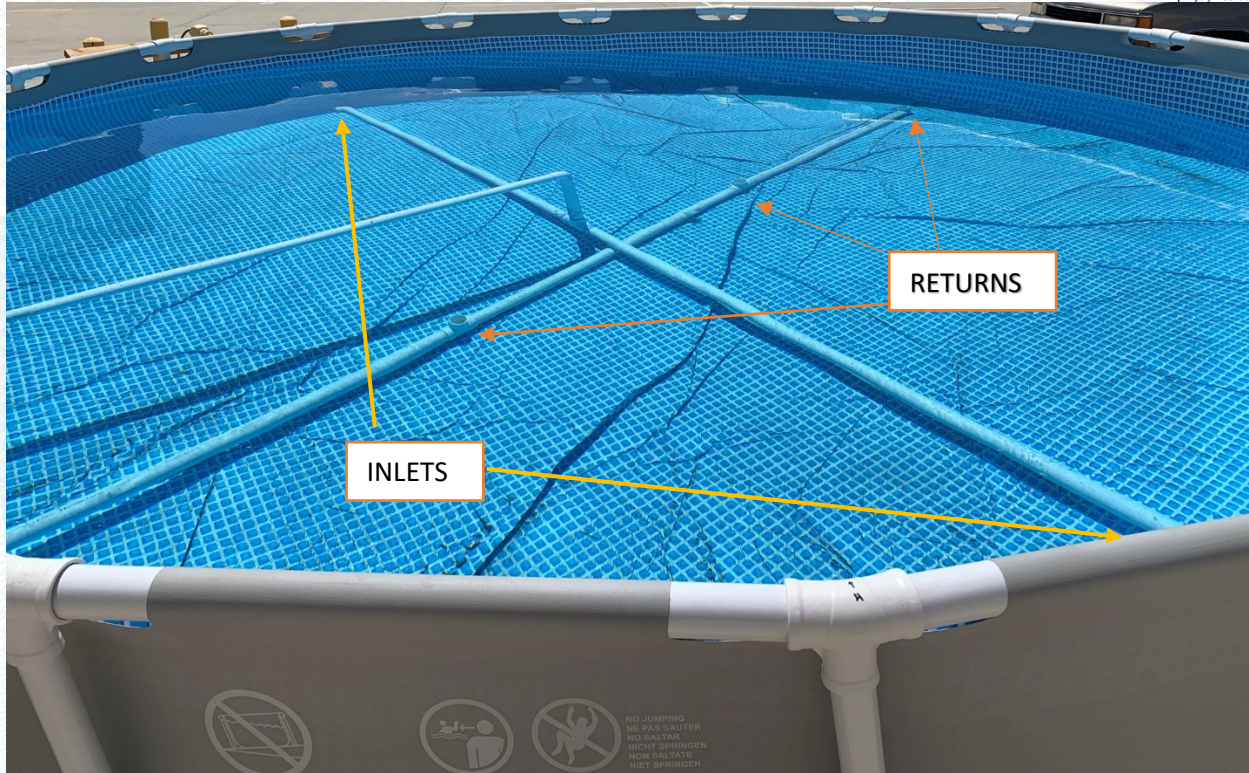


Figure 3- Layout of Inlets and Returns- Same for Both Pools