

Southpoint Solutions, LLC

Georgia Office
1345 Capital Circle
Lawrenceville, GA 30043
Phone 770-995-7554
Fax 770-995-7893

Carolinas Office
9081 Northfield Drive
Fort Mill, SC 29715
Phone 803 802 7330
Fax 803 802 7332

SFV TEST RESULTS High Performance Lighting



Test Performed for: The Stanley Works
Cheraw, South Carolina

Device under test #1: Orion CM6

Device under test #2: ILP HS-6T8-UH

Test Dates: November 16, 2006 - February 22, 2007

Report Date: February 19, 2007

Test Summary

The Stanley Works
100 Stanley Road
Cheraw, SC 29520

Test Dates: 11/16/2006 - 11/28/2006

Notes:

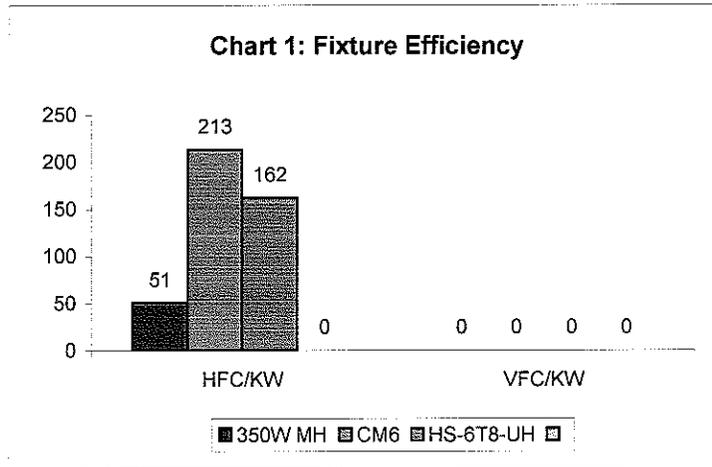
- ✓ Orion InteLite® compact modular fixture verses 350W pulse start metal halide
- Measurements recorded by Kenny Sellers, Maintenance manager - Stanley



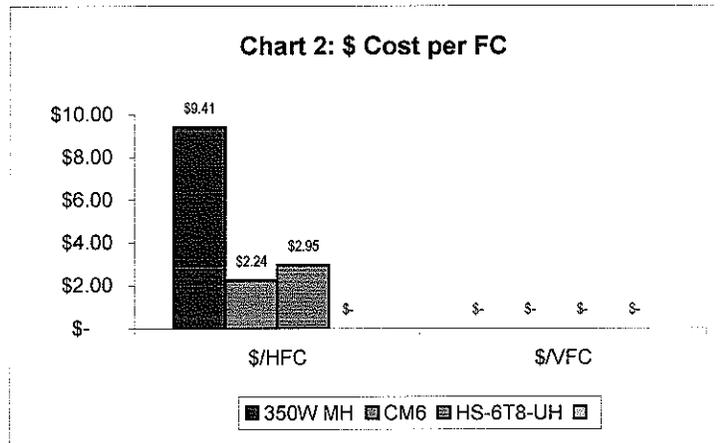
Device under test		Test 1		Test 2		Test 3			
350W MH		CM6		HS-6T8-UH		0			
Delivered Light Test									
Test Type	Notes	Range	Average	Range	Average	Range	Average	Range	Average
Fixture Height		0							
Horizontal (FC)	48" AFF	3.9-33.4	18.29	24.4-46.8	35.45	24.2-41.0	31.4	0	0
Vertical (FC)	52" AFF	0	0	0	0	0	0	0	0
Ambient/Obstructions		none		none		none		0	
Color Rendering Index	CRI	65		86		86		0	
Lamp Type		MH		T8		T8		0	
Lamp Color Temp.	Deg. Kelvin	4000		5000		5000		0	
Average Light Variance	Horizontal					94%		72%	
	Vertical	-							
Energy Test									
Circuit Amperage		10.40		4.80		5.60		0.00	
Test Fixture Count		8		8		8		0	
Total Fixture Count		525		525		525		0	
Fixture Amperage		1.30		0.60		0.70			
Voltage		277		277		277		0	
Fixture KW		0.360		0.166		0.194			
Total KW Variance	(KW)			102		87			
Total AMP Variance	(Amps)			368		315			
Fixture KW Variance	(%)					-54%		-46%	
Financial Test									
Annual Operating Hours:	6864	Rate (\$):	0.0696						
Annual Operating Cost	Unit	\$	172.03	\$	79.40	\$	92.63		
	Total	\$	90,317	\$	41,685	\$	48,632		
Cost Variance (Waste Reduction)				\$ (48,632)		\$ (41,685)			
Objective Performance Results									
		350W MH		CM6	Variance	HS-6T8-UH	Variance		
Throughput Ratio	HFC/KW			213	320%	162	219%		
Throughput Ratio	VFC/KW								
Annual KWh Cost Ratio	\$/HFC			\$ 2.24	-76%	\$ 2.95	-69%		
Annual KWh Cost Ratio	\$/VFC								



The following chart shows the measured light output per kilowatt of input energy. Light output is measured in terms of “vertical foot candles” (VFC) and “horizontal foot candles” (HFC) delivered to a specific point in the facility. The light readings for each fixture type are measured at the same locations and then averaged to arrive at the following results: (The higher the number the better performing the fixture.)



The following chart shows the operating cost of each “foot candle” of delivered light. The total cost of operating each fixtures is divided by the light it delivers and the results are as follows: (The lower cost, results in less operating costs)



Take the required level of light in terms of “foot candles” and multiply it by the figures in Chart 2 to get the real cost of lighting for a specific light level.

Purpose of the System Field Verification Test

Prior to investing in any lighting solution, the buyer must **establish a benchmark of functional requirements for system performance**. Otherwise, the decision may lead to purchasing a solution which will be seen as inadequate and perhaps even be removed later in order to bring the conditions back to an acceptable level. Since most lighting systems are purchased infrequently, established functional requirements are rarely right at hand.

Step 1

When evaluating any lighting project, the buyer must consider no less than four factors for system performance:

- a. Relative Light Output (Color Rendering, Delivered Foot-Candles [not lumens], Shadows)
- b. Financial (Up-front Costs, Operating Cost, Return on Investment, Tax implications, Lead time, Installation costs which vary from fixture to fixture, Re-lamping costs)
- c. Waste reduction (Energy, pollution, demand controls)
- d. Quality (Flexibility, Installation considerations, Durability, Component protection, Weight, Thermal efficiency, Support)

Failing to recognize these four factors may lead the buyer to pay for a benefit for which he/she does not need, or alternatively, forgo a benefit that would reduce long-term costs and increase flexibility.

Arriving at a specific set of functional requirements is the first step in knowing whether one solution is better than an alternative. A good solution balances the four factors and meets each of the requirements without delivering too much of one while sacrificing another.

For example, most people *want* more light but won't pay incrementally to get it. If the Light requirement is for 50 foot-candles (FC) of delivered light at the work plane, and a solution delivers 60FC, the buyer generally will not pay extra to get the additional light.

The same logic usually applies to the financial factor. When considering two alternatives, the buyer will not pay more to get a shorter payback period so long as the solution meets the functional requirement. For example, if the functional requirement for the financial factor is having a 2 year payback or less; and if solution A costs \$50,000 and has a 1.9 year payback and solution B costs \$53,000 but has a 1.7 year payback, the buyer will almost always choose solution A; even though the year-over-year electric saving are greater. Unless, of course, the waste reduction functional requirement demands a certain energy reduction, in which case that requirement must be considered.

And finally, the quality factor, which is often overlooked in many purchases, must be defined. Quality is not always defined in terms of workmanship. Portability, expandability, interchangeable parts, non-proprietary, or standard components, installation costs, among other considerations must be thought through carefully. A low cost system, may likely rust,

add maintenance cost, perform poorly over time, or shorten electronics life due to excessive heat buildup. **Look for U-L Portable Luminaire** status marked on the fixture. This certification means that *each and every fixture* was Hipot tested (Performs AC Dielectric and Insulation Resistance tests), is lightweight, and has a detachable cord at the fixture side. Portable Luminaires cost less to install and maintain, have less stringent National Electric Code restrictions for mounting, hanging, and wiring, and provide potentially more income tax benefits.

At the very least, the buyer should establish the following functional criteria before proceeding to Step 2:

- a. Minimum average Foot-candle for each area of the facility
- b. Maximum payback period for the investment
- c. Minimum energy waste reduction, sometimes "foot-candles per watt" is used
- d. Minimum performance levels of the various quality issues.

After these requirements are documented, the buyer should test the various solutions since one solution may meet some of the requirements, but fail others.

Step 2

The purpose for the system field test is to answer two primary questions:

1. Will the project actually deliver on the performance claims, i.e. better light, ease of installation, and other functional requirement; and
2. Will the project actually deliver the return to justify the investment?

In terms of item 1, your lighting representative will assist you in selecting a location for the light test. **All the various solutions should be evaluated in identical conditions.** Light reflectance and porosity of obstructions will have an effect on foot-candles delivered. Since light meters are not calibrated the same, one light meter must be used to measure foot-candles for each system. Ocular or "see-ability," while subjective must be documented in such a way that a system provider can adjust its system to "fine-tune" his/her solution. Many times a buyer will choose a system based on subjective criteria, not recognizing that the other system provider could deliver the same "see-ability" by fine-tuning the lamp, ballast, or reflector system.

A utility grade energy meter must be used to measure energy consumption over a period of time. Amp meters and a calculator are not sufficient and can be inaccurate as those devices only measure at single points of time rather than logging data over a period of time. High quality companies will provide a utility grade energy meter to not only provide a common measurement platform for energy savings, but also log emission reduction for emission registration at the State and Federal level. In some States, these credits can be worth more than the energy savings. If your system provider does not have a utility grade meter, look for one who does. Many claims are made in the lighting industry that cannot be backed up by facts. Do your homework, and seek out reputable companies with a history of doing business with nationally recognized companies.