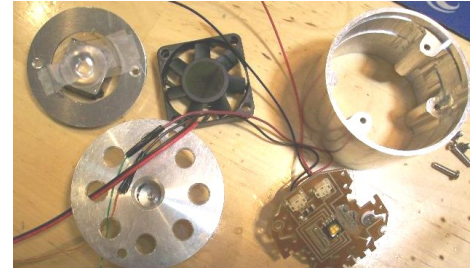
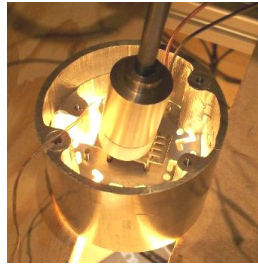


Here is prototype of LED fixture with Active Cooling System (ACS) based on combination of original heat sink (HS) – copper; 9.2g; 32 cm x cm and DC Fan 40x40x10 mm; 12V; 1W. LED fixture has cylindrical aluminum housing with top and bottom covers.



POWER	ts	T' LED	T' 1 PCB	T' 2 HS	T' 1 - T' 2	Tamb	T's - T'amb	Rs
Wt	min	'C	'C	'C	'C	'C	'C	'C/Wt
9.0	10.5		52.2	36.7	15.5	21.9	22.55	2.52
MC HS	S HS	k			h	Rm	Rh	
g	cmxcm				Wt/m^2 'C	'C/Wt	'C/Wt	
9.2	32.0				119.6	68.24	2.61	

To Compare with Passive cooling (Example 5)

POWER	ts	T' LED	T' 1 PCB	T' 2 HS	T' 1 - T' 2	Tamb	T's - T'amb	Rs
Wt	min	'C	'C	'C	'C	'C	'C	'C/Wt
8.1	13		73.05	71.44	0.83	21.8	27.79	3.43
MC HS	S HS	k			h	Rm	Rh	
g	cmxcm				Wt/m^2 'C	'C/Wt	'C/Wt	
50	110.5	9000			21.2	17.39	4.27	

We can see significant improving Thermal Management by applying of ACS to compare with Passive cooling: T*s less in rate 1.5 at even higher input electrical power; mass of HS less in rate 5; area of HS less in rate 3. Forced air provides the increasing of heat dissipation of HS (coefficient of convective heat transfer more in rate 5) and reduces total thermal resistance Rt in the rate about 1.5. Additional power consuming for Fan is about (0.25 – 0.4) W which is in turn about 4.5% of input electrical power. As result LED fixture could be built in more economical way, with size, shape and weight more appropriate for art design requirements.

