SOFASCO INC

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DC FAN LIFE TEST REPORT

Available for these models with lower speed and same physical structure. This report applies to models as the below table.

DB5015V12Y	-	-
-	-	-
-	-	-
Y may be H or lower speed		

Representative test model : **DB5015V12H**

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Approved By : Chen Bo ***Date : 2006/3/28***

FORMULA AND PARAMETER

1. L_{10} Expectancy : **70,000** hrs. minimum @fan rated voltage and temperature of 40℃.

2. Formula : According to the method of Webull distribution,MTTF ≒ 7 × L_{10}= **490,000** hrs.

   Base on a safety coefficient --- 1.3 times, the target time of L_{10} is **91,000** hrs.

   And the target time of MTTF is **637,000** hrs.

   We depend on a zero failure Webull test strategy and accelerated testing technique, to determinethe total test time (t) for verifying the above life estimation by the equation,

   $$t = 1.036 \times MTTF \times [(B_{r;c}) \div n]^{0.91} \div A_F, \text{ and } A_F = 2^{(Ts-Tu)/10}$$

   where, (Br;c) is Poisson distribution factor with the failure number of r equal to 0 and the decimal confidence level of c equal to 0.90 (90%).

   Sample size (n) : 50 pcs. Acceleration factor (A_F) : 16

   Stress temperature (Ts) 80 ℃ Unstress temperature (Tu) : 40 ℃

   Poisson distribution factor ($B_{r;c}$) : 2.3026

   We get required test time with zero failure = 2,506 hrs.

3. Parameter :
   1. For current, the limit is less than spec. (max.).
   2. For speed, the acceptable decrease is no more than initial +15%.
   3. For noise, the limit is no more than spec. +15%.

4. Test Date :
   1. Date of test start : 2005/12/12 10:00
   2. Date of test termination (Estimated) : 2006/3/26 20:00
   3. Date of test termination (Actual) : 2006/3/27 10:00

※ If the actual test time exceed the required, it comes out that those fans' life expectancy and MTTF are greater than warrant.

5. Test Equipments :
   1. Thermostated container :
   2. DC power supply :

RESULT

1. Current Test Status :

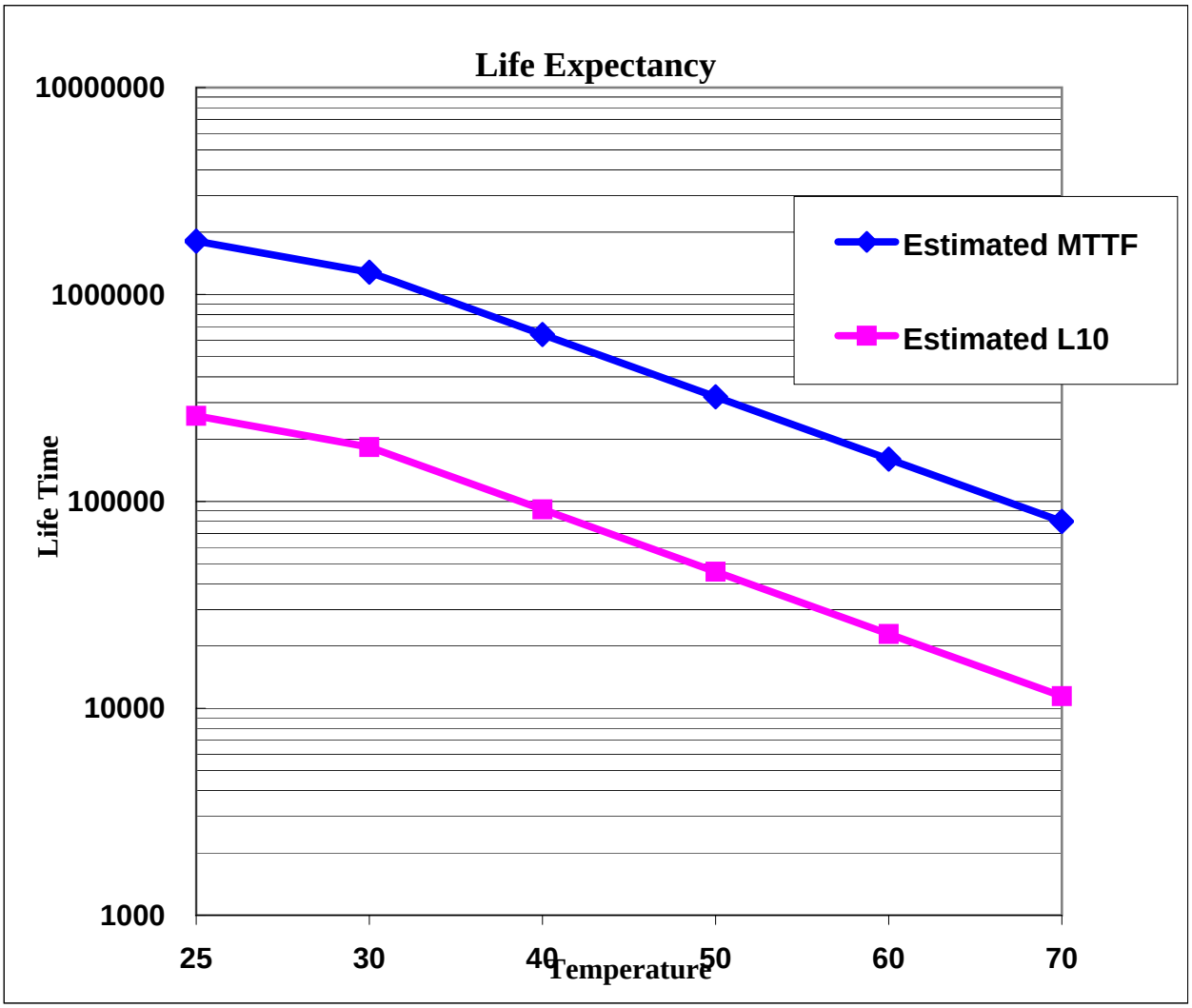
▶	Customer Request	▶	New Product
▶	Component Change	▶	Routine Test

1. Actual Test Hours : 2,520 hrs.

2. Verified MTTF : 640,626 hrs.

3. Verified L_{10} : 91,518 hrs.

Temperature / Value	25	30	40	50	60	70
A_F	45.25	32	16	8	4	2
Estimated MTTF	1811964	1281252	640626	320313	160157	80079
Estimated L_{10}	258852	183036	91518	45759	22880	11440



BEFORE TEST

Sample No.	Current Spec.		Deviation	Speed Spec.		Deviation	Noise Spec.		Deviation
	0.22 Max.	0.22 Max.	%	6500 Ref.	5525 Min.	%	46.7 dBA	53.7 dBA	%
	Initial	Final		Initial	Final		Initial	Final	
1	0.20	0.19	-5.0%	6553	6604	0.8%	45.1	46.9	1.8
2	0.19	0.20	5.3%	6627	6476	-2.3%	44.5	44.8	0.3
3	0.19	0.20	5.3%	6687	6548	-2.1%	44.9	47.6	2.7
4	0.19	0.19	0.0%	6646	6931	4.3%	46.5	47.6	1.1
5	0.19	0.19	0.0%	6613	6438	-2.6%	45.6	48.7	3.1
6	0.19	0.20	5.3%	6633	6849	3.3%	45.5	45.9	0.4
7	0.19	0.19	0.0%	6634	6386	-3.7%	45.6	48.9	3.3
8	0.19	0.20	5.3%	6593	6573	-0.3%	44.6	46.6	2.0
9	0.19	0.19	0.0%	6526	6845	4.9%	44.6	46.1	1.5
10	0.19	0.19	0.0%	6557	6656	1.5%	45.2	48.8	3.6
11	0.19	0.19	0.0%	6564	6782	3.3%	45.6	46.6	1.0
12	0.19	0.19	0.0%	6569	6409	-2.4%	44.6	47.4	2.8
13	0.19	0.19	0.0%	6695	6638	-0.9%	46.2	48.1	1.9
14	0.19	0.19	0.0%	6602	6462	-2.1%	45.0	45.4	0.4
15	0.19	0.19	0.0%	6692	6385	-4.6%	45.2	46.8	1.6
16	0.19	0.19	0.0%	6533	6756	3.4%	45.2	45.9	0.7
17	0.19	0.19	0.0%	6535	6787	3.9%	44.7	45.9	1.2
18	0.19	0.19	0.0%	6527	6865	5.2%	45.6	47.7	2.1
19	0.19	0.19	0.0%	6607	6809	3.1%	45.5	49.0	3.5
20	0.19	0.19	0.0%	6626	6945	4.8%	44.8	45.9	1.1
21	0.19	0.19	0.0%	6530	6281	-3.8%	44.7	47.5	2.8
22	0.19	0.19	0.0%	6610	6355	-3.9%	45.2	47.7	2.5
23	0.20	0.18	-10.0%	6523	6734	3.2%	46.4	48.7	2.3
24	0.19	0.19	0.0%	6505	6668	2.5%	46.4	47.6	1.2
25	0.20	0.19	-5.0%	6574	6429	-2.2%	45.1	45.4	0.3
26	0.19	0.19	0.0%	6554	6659	1.6%	46.6	50.4	3.8
27	0.19	0.20	5.3%	6685	6472	-3.2%	45.1	46.9	1.8
28	0.19	0.20	5.3%	6654	6503	-2.3%	44.2	47.9	3.7

BEFORE TEST

Sample No.	Current Spec.		Deviation	Speed Spec.		Deviation	Noise Spec.		Deviation
	0.22 Max.	0.22 Max.	%	6500 Ref.	5525 Min.	%	46.7 dBA	53.7 dBA	%
	Initial	Final		Initial	Final		Initial	Final	
29	0.19	0.19	0.0%	6681	6534	-2.2%	45.8	46.2	0.4
30	0.20	0.20	0.0%	6501	6293	-3.2%	45.4	46.4	1.0
31	0.20	0.19	-5.0%	6677	6405	-4.1%	44.3	46.4	2.1
32	0.19	0.19	0.0%	6645	6686	0.6%	44.9	47.6	2.7
33	0.19	0.19	0.0%	6681	6661	-0.3%	45.2	48.8	3.6
34	0.19	0.19	0.0%	6553	6311	-3.7%	45.9	48.5	2.6
35	0.19	0.19	0.0%	6696	6666	-0.4%	46.1	47.1	1.0
36	0.19	0.20	5.3%	6638	6449	-2.8%	45.0	46.1	1.1
37	0.20	0.19	-5.0%	6551	6858	4.7%	45.2	46.2	1.0
38	0.19	0.20	5.3%	6498	6688	2.9%	45.7	46.2	0.5
39	0.20	0.19	-5.0%	6654	6493	-2.4%	45.0	46.6	1.6
40	0.19	0.19	0.0%	6573	6608	0.5%	46.5	50.3	3.8
41	0.19	0.20	5.3%	6640	6925	4.3%	44.6	47.9	3.3
42	0.19	0.19	0.0%	6518	6936	6.4%	46.3	49.0	2.7
43	0.19	0.19	0.0%	6580	6913	5.1%	46.4	46.9	0.5
44	0.19	0.19	0.0%	6565	6527	-0.6%	46.2	48.8	2.6
45	0.19	0.19	0.0%	6506	6557	0.8%	45.0	47.4	2.4
46	0.19	0.19	0.0%	6602	6910	4.7%	45.3	46.6	1.3
47	0.20	0.19	-5.0%	6518	6325	-3.0%	46.1	48.0	1.9
48	0.19	0.19	0.0%	6502	6559	0.9%	44.8	47.7	2.9
49	0.19	0.20	5.3%	6590	6804	3.2%	44.3	45.4	1.1
50	0.19	0.19	0.0%	6669	6942	4.1%	46.2	48.1	1.9
Max.	0.20	0.20	5.3%	6696	6945	6.4%	46.6	50.4	3.8
Min.	0.19	0.18	-10.0%	6498	6281	-4.6%	44.2	44.8	0.3
$\bar{X}$	0.19	0.19		6593.8	6625.9		45.4	47.3	
σ	0.004	0.005		62.0	200.2		0.67	1.26	