Dated : July 19, 1999

Cost Saving Analysis
Of
Chiller Treated With Blygold and Chiller without Treatment

COPY

Location	: Bank of East Asia Building at Wan Chai Hong Kong		
Background	: 4 x 100 R.T. chiller-30GA105 were installed more than10 years ago. and in 1995 the condenser coil were replaced due to deterioration, two of which were treated with Blggold.		
Assumption	: (the condensing air flow rate, refrigerant flow rate, chilled water flow rate and other mechanical or electrical loss are equal.)		
Observation On Site - 4 year later			
		Without treatment	Treated with Blygold
Out door temperature 92 F			
Chiller unit No.		Unit A	Unit C
Model		30GA105	30GA105
Condenser coil conditions		Fins brittle to touch	Fins remain uncorroded
Refrigerant		R-22	R-22
Compressor total running Amp.	A	213.0	203.0
Condensing Air entering Temp.	F	92.3	92.3
Condensing Air outlet Temp.	F	114.8	109.4
Condenser inlet pressure	PSIG	325.0	265.0
Condenser inlet temperature	F	220.0	200.0
Discharge Enthalpy (h 2) refer refrigerant chart	BTU/LB	135.0	132.0
Liquid line sub-cooling temperature	F	109.4	102.2
Liquid line sub-cooling enthalpy (h 3, h 4)	BTU/LB	40.0	40.0
Suction pressure	PSIG	55.0	55.0
Suction superheated temperature	F	51.8	51.8
Suction enthalpy (h 1)	BTU/LB	111.0	111.0
Chilled water inlet temperature	F	51.8	52.7
Chiller water outlet temperature	F	42.8	42.8
Performance calculation based on refrigeration cycle			
Heat reject (h2 - h3)	BTU/LB	95.0	92.0
Refrigeration effect (h2 - h4) output	BTU/LB	71.0	71.0
Heat of compression (h2 -h1) input	BTU/LB	24.0	21.0
Coefficient of Performance COP (output /input)	COP	3.0	3.4
Power consumption (A*380*1.73*0.85 power factor)	KW	119.0	113.4
Estimate the cooling capacity based on the power consumed x COP x Mechanical loss & other heat transfer effectiveness (0.85)			
Estimated Cooling Capacity	KW	299.3	326.0
Cooling Capacity in Refrigerant Tonnage	R.T.	85.1	92.7
Energy Efficiency Ratio EER	KW / R.T.	1.40	1.22
Energy cost Saving for chiller C with Blyglod treatment			
Energy saving per R.T. (chiller A - chiller C)	0.18	KW / R.T.	
Energy saving per day based on 92 R.T.	16.6	KW	
Assume 8 hours operation per day (0.18*92*8)	132.5	KW	
Energy saving per years based on	30390.0	KW	
148 days @ 100% capacity			
74 days @ 70% capacity			
74 days @ 40% capacity			
Cost saving (HK$0.9 / KWH * 30390KW)	**27,351**	**dollars**	

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