

IceCOLD[®]

CASE STUDY

Test results

IceCOLD® Performance

Client: CAJAMAR ALMERIA

it is recommended that you print out the original report and this translation and follow them side by side as this translation contains no pictures, charts, or signatures.

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Summary execution:

To validate the results of the performance of IceCOLD® technology has been conducted a test run on (comfort air) air conditioning units three offices properties in Almeria and Roquetas de Mar.

Testing has resulted in a reduction of Kw / Hrs of 28% , 17% and 8%, but the temperature difference in the road before and after the collecting data , a saving of 27%, 16% and 8%. This results in electricity savings of 17% direct means and therefore an equivalent reduction in CO₂ emissions . This result is fits the savings rate IceCOLD ® is gaining in all Tests with different customers .

In addition to the compelling and sustained energy savings produced , add some application considerations strategic :

I. IceCOLD® catalysts that produce these results are "dynamic" in nature. In other words , the savings obtained initially introducing IceCOLD® in the system are performed to extend its life and as a result there is no need revert to the units. Additionally, since the payback period in this case is 10.5 months , resulting in an Return on Investment (ROI) of over 500+% annualized for each year subsequent operation . See the Financial Considerations at the end the report.

II. The "essence" of IceCOLD® energy savings lies in getting the systems compressor to run by 20% less (on average), obtaining a result of operation beyond pre-installation. As such, the TMEEM (mean time between overhauls) and eventual costs different parts of the system is 20%. These small savings that derived from the extension of the life of the system are not included in the financial considerations outlined in this proposal.

Description of the test:

As stated above, the objective of this study was verify by testing the reality of the benefits provided by IceCOLD® . This test at the selected location represents a challenge in terms of people cooling (comfort cooling) , taking into account the characteristics of the installation and the different factors combined.

System Description :

testing has proceeded on different models of machines, and in different systems such as VRV air conditioning. Daikin III is one of the most efficient systems on the market, and it is direct expansion DX.

We treated these units with IceCOLD® and have monitored the full test period

Test Methodology :

The protocol used for the test can be summarized as:

- I. First Week: Installed a brand HOBO data logger to capture consumer Amp / h information. every 90 seconds during pre -installation period of one week .
- II. Second week: IceCOLD® was introduced and maintained units in running IceCOLD® leaving work . During this period ,recorded in all the cases remained in " stand by" waiting complete dissolution and action in the system.
- III. Third week : This past week completed dataset post- installation.

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BEFORE IceCOLD®	AFTER IceCOLD®
AMP DAYS . CDD MACHINE	DAYS AMP . CDD MACHINE
27/08/13 4342.977	28.3 09/09/13 3426.391 25.3
28/08/13 4258.17	28.2 10/09/13 3958.621 25.8
29/08/13 4165.918	28.1 11/09/13 4161.407 27.4
30/08/13 2793.325	26.2 12/09/13 4020.181 28.1
02/09/13 5170.991	27.4 13/09/13 2490.917 27.5
25.8 3879.573	9/16/13
27.2 4155.695	9/17/13
25.3 4446.898	9/18/13
26.5 3816.841	9/19/13
AVERAGES 27.6	4146.2762
26.5 3817.391556	
AMP CONSUMPTION REDUCTION .	328.8846444
REDUCTION OF CONSUMPTION %	8 %
Temp REDUCTION	-4 %
FINAL CONSUMPTION REDUCTION	8%
Offices at 116 Almeria :	
OFFICE DAILY CONSUMPTION 116 ALMERIA	
BEFORE IceCOLD	AFTER IceCOLD
AMP DAYS . CDD MACHINE	DAYS AMP . CDD MACHINE
27/08/13 6037.031	28.3 09/09/13 3696.839 25.3
28/08/13 3774.759	28.2 10/09/13 5254.143 25.8
29/08/13 4008.502	28.1 11/09/13 3325.379 27.4
30/08/13 4596.708	26.2 12/09/13 3601.904 28.1
02/09/13 5702.991	27.4 13/09/13 3729.401 27.5
25.8 3224.771	9/16/13
27.2 5022.684	9/17/13
25.3 4206.053	9/18/13
26.5 3925.576	9/19/13
AVERAGES 27.6	4823.9982
26.5 3998.527778	
AMP CONSUMPTION REDUCTION .	825.4704222
REDUCTION OF CONSUMPTION %	17 %
Temp REDUCTION	-4 %

FINAL CONSUMPTION REDUCTION 16 %

Office at Roquetas de Mar:

DAILY CONSUMPTION Roquetas

BEFORE IceCold AFTER IceCold

MACHINE TOOL 1 DAY 2 DAYS CDD MACHINE TOOL 1 2 CDD

27/08/13 1517.115 1884.578 28.3 09/09/13 2226.133 763.429 25.3

28/08/13 1513.148 3505.229 28.2 10/09/13 1634.248 908.78 25.8

29/08/13 1454.845 1869.696 28.1 11/09/13 2178.364 1235.69 27.4

30/08/13 1513.252 983.014 26.2 12/09/13 2208.909 651.076 28.1

02/09/13 2126.885 4651.063 27.4 13/09/13 1749.578 873.917 27.5

16/09/13 1917.783 2070.033 25.8

17/09/13 1970.597 575.252 27.2

18/09/13 1699.894 769.618 25.3

19/09/13 2352.186 1301.036 26.5

AVERAGES 27.6 2578.716 1625.049

1016.536778 1993.076889 26.5

ADDITIONS 3009.613667 4203.765

AMP CONSUMPTION REDUCTION . 1194.151333

REDUCTION OF CONSUMPTION % 28 %

Temp REDUCTION -4 %

FINAL CONSUMPTION REDUCTION 27 %

CONCLUSION :

The teams saw data of an average improvement of 17.6 % at the 3 offices. While it is true that data collection after installation IceCOLD® had a decrease in the outdoor temperature of 4% (CDD), data infers the improvement stayed at 16.95%. The average achieved in the three offices is reduced from the average score by IceCOLD®. In other procedures, Office 86 with the system V.R.V. Daikin III is oversized, this means that the system could be smaller, thus saving on energy consumed.

Eliminating this office obtained the average, this would be 21.5% of improvement, a fact that is increased from the average obtained by IceCOLD® in his other performances .

Financial Considerations :

The IceCOLD® installation will provide a significant impact on the CAJAMAR operational efficiency , as well as your bottom , and in the carbon footprint . Should be taken into account the following considerations:

consumption was measured using the 3 previous units 13,174.02 Amp / day for the first week or week of Pre -Installation, of 10h considering daily work 5 day work week 6587.01 supposed Amp / h .

considering the constant voltage (240V) is 6587.01 translates Kw / h. and a cost of 0.14 € / kWh can be considered a weekly expenditure of € 922.18 , multiplied by 52 weeks, an annual expenditure of 47,953.43 - €

In subsequent measurement , with the same considerations, the Data were 10825.52 Amp / day for 52 weeks, € 39,404.89

The improvement achieved a savings of 8,548.53 - € / year.



Investment in IceCOLD® is 7.500 - € once.
This means , a pay back period (PAYBACK) of 10.5 months.
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