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Tops

system efficiency and allowed the unit to operate at a lower evaporator temperature, reduce the product holding temperature and have off cycle periods. With the injection of **PermaFrost®** an over-all increase in refrigeration capacity of 37% was achieved and 9% reduction in runtime was recorded. This is a good example of **PermaFrost®** working in freezer room environment.

33 DX → Galipo

An evaluation of the effects of **PermaFrost®** on a refrigeration system for a cool room at Galipo Foods - Adelaide, South Australia, Australia was conducted in October of 2004. The refrigeration system utilized a Bitzer reciprocating air-cooled condensing unit, model 4FC-52Y running on R-404A refrigerant. The tests carried out on the refrigeration system of the cool room indicated an improvement in the cooling capacity of 12 % and an increase in system performance of a similar 12 % after treatment with **PermaFrost®**. The increase in cooling capacity and system performance will result in the compressor using less energy to achieve the same cooling effect in the cool room.

34 DX → Hobsons Bay

An evaluation of **PermaFrost®** in Melbourne, Australia was conducted on a packaged DX unit equipped with R-22 in May 2004. The tests carried out on this refrigeration system indicate an improvement in performance of 15.5% after treatment with **PermaFrost®**. The increase in cooling capacity and system performance will result in the compressor using less energy to achieve the same cooling effect on the chilled water as prior to treatment with **PermaFrost®**. The decrease in energy usage by the compressor will correspond approximately to the increase in the system performance. This is achieved by a reduction of the compressor run time to produce the same cooling effect on the air conditioning system. Consequently, energy savings for similar conditions will be in the order of 15.5%.

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35 DX → Mister Singh's Restuarant

This is a test administered by **PermaFrost Solutions**, our associates in County Clare, Ireland, on a Daikin Air - Conditioning System, (used for both heating & cooling). A comparison of the two data collection periods, (before and after installation), indicates a significant increase in system performance after the installation of **PermaFrost®** into the system. The system showed significant increases in compressor efficiency, COP and cooling capacity. In the case of this unit the COP increased by 14.4%. These are all strong indicators that the isentropic efficiency of the compressor increased substantially resulting in a more efficient machine that is cheaper to maintain and to operate over extended periods of time. This test was run in November, 2009, and provides excellent evidence of **PermaFrost®** working in a restaurant environment.

36 DX → Mervyns, Mesa, AZ

These tests show the Measurement and Performance Data and Analysis for the Rooftop AC units at Mervyn's, in Mesa, AZ. In the data for the nine rooftop AC units, both the energy efficiency ratio and the kw/ton characteristics of the rooftop units showed significant improvements after the **PermaFrost®** installation. Specifically, the kw/ton improvements directly translate to lower energy consumption and electrical costs. The total kWh electrical usage showed a 9.4% decline in metered energy usage post-**PermaFrost®**. The estimated energy savings per month was 12,756 kWh. At a current energy and demand blended electricity rate from Mesa Electric Utility Co. of $0.08/kWh, this translates to a savings of $1 ,020/month or an annualized basis of $12,246 per year. The equipment at this location ranged from 7.5 to 40 ton packaged units. Individual unit results can be viewed in the full report at ***powertronglobal.com*** This installation occurred in the summer of 2006.

37 CH → Mervyns, Laredo, TX

This **PermaFrost®** 1 year evaluation was performed at a Mervyns retail clothing store location in Laredo, Texas. Two 158 ton York Chillers model YCWJ58RS-48PE equipped with R-22 were monitored in November of 2008.Both direct and indirect benefits were recorded. All monitoring was performed by The Towering Company, a third party engineering firm. The data collected pre- and post-**PermaFrost®** was

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Mervyns, Laredo, TX

converted into two different corresponding refrigeration system models (pre and post **PermaFrost®** installation) and input into a computer-generated energy calculations program based on ASHRAE and ARI industry standard data. These units had a COP improvement of 30% (Ch 1) and 35% (Ch 2). These results reflect an annual decrease of 42% in energy consumption by the chillers with a corresponding 42% annual decrease in chillers energy costs.

38 DX

Glanbia

This test was administered by Kelly Refrigeration, Ennis, County Clare, Ireland, for Rosderra Plant, Clara, Ireland in October 2009. Rosderra Irish Meats Group Ltd is a leading Irish food company. It is an international company. The work was completed on a Prestcold Condensing Unit with dual discharge evaporators. 10 fluid ounces of **PermaFrost® DX – Mineral Oil Blend** were installed into the unit. The unit's cooling capacity increased by 8%. This coupled with the noted improvement of 10% in COP will allow the unit to reach set temperatures faster. The system is now running approximately 10% more efficient which will result in an approximate 10% reduction in energy consumption and associated cost. Additionally, the end-user can expect savings in on-going maintenance and expected equipment life since the unit is now operating more efficiently.

39 DX

Irish Tax & Customs Revenue 1

Test administered by Kelly Refrigeration, Ennis, County Clare, Ireland, for Revenue Irish Tax & Customs Unit 1 in September of 2009. The purpose of this test was to show the effects of **PermaFrost®** on a Mitsubishi Mr Slim - 6 HP split air conditioning unit at the Revenue Commissioners office in Ennis, Ireland. The unit selected for this test is one of two units utilized to cool the data storage room within the Revenue Commissioners office complex. Due to the demand required to cool the data storage room the unit runs for approximately 20 to 21 hours per day making it an excellent candidate for the test. In the case of the Revenue Commissioner's office the unit's cooling capacity increased by approximately 8%. This coupled with the noted improvements in COP and evaporator temperature will allow the unit to reach set temperatures faster. The system is now running 8% more efficient which will result in an approximate 8% reduction in energy consumption and associated cost. Further increases in system performance can be expected over the next 2 to 3 days. Additionally, the end-user can expect savings in on-going maintenance and expected equipment life since the unit is now operating more efficiently.

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40 DX → Irish Tax & Customs Revenue 2

Test administered by Kelly Refrigeration, Ennis, County Clare, Ireland, for Revenue Irish Tax & Customs Unit 2 in September of 2009. The purpose of this test was to show the effects of **PermaFrost®** on a second Mitsubishi Mr Slim - 6 HP split air conditioning unit at the Revenue Commissioners office in Ennis, Ireland. The unit selected for this test is one of two units utilized to cool the data storage room within the Revenue Commissioners office complex. Due to the demand required to cool the data storage room the unit runs for approximately 20 to 21 hours per day making it an excellent candidate for the test. In the case of the Revenue Commissioner's office the unit's COP increased by 9.2% despite a 5% increase in ambient temperatures from pre to post data collection periods. This coupled with the noted improvements in cooling capacity and evaporator temperature will allow the unit to reach set temperatures faster. The data shows that the system is now running approximately 9% more efficient which will result in an approximate 9% reduction in energy consumption and associated cost.

41 DX → Cadbury

Test administered by **PermaFrost Solutions**, Ennis, County Clare, Ireland; and Artic Air, Dublin, Ireland in November of 2009 . The purpose of this test was to show the effects of **PermaFrost®** on a Bitzer open drive semi hermetic water cooled skid DX refrigeration system at Cadbury Limited, Coolock, Dublin, Ireland. The unit selected for this test is a single condensing unit used for refrigeration requirements within the store. The unit works under a high load factor due to customer traffic within the store. In the case of Cadbury the unit's cooling capacity increased by approximately 12.40% and COP increased to 11.56%. This coupled with the noted improvements in COP and system efficiency will allow the unit to reach set temperatures faster. The system is now running 12% more efficient which will result in an approximate 12% reduction in energy consumption and associated cost. Additionally, the end-user can expect savings in on-going maintenance and expected equipment life since the unit is now operating more efficiently.

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42 DX → Londis

Test administered by Refrigeration Solutions, Kilnamanagh, Tallaght, Ireland for Londis - Clane, County Kildare, Ireland in October of 2009. Londis has a wide network of stores including Londis PLUS Supermarkets, Londis Foodmarkets, Londis Convenience and Forecourt stores. 5 fluid ounces of **PermaFrost®** **DX – Synthetic Oil Blend** were installed into Copeland condensing units in tandem. Post installation results given by the ClimaCheck performance analyzer showed a COP improvement of 9.6%.

43 DX → Guinness

Test administered by Dalkia, Ireland for Guinness Diageo Dublin, Ireland in November 2009. The equipment installed with **PermaFrost®** was a 1.5 HP Refrigeration Unit in the Beer Cold Room, a Lunite Hermetique Condensing Unit and a Friga Bohn Evaporating Unit. The system showed significant increases in compressor efficiency of 8.9%, COP 13.3% and cooling capacity of 13.9%.

44 DX → Supervalu 1

The test was administered by Kelly Refrigeration, County Clare, Ireland and Artic Air in Dublin, Ireland in September of 2009. SuperValu is a supermarket chain in Ireland and Spain. **PermaFrost® DX – Synthetic Oil Blend** was installed into Hitachi Central Refrigeration Pack unit. In the case of Supervalu-Dublin the unit's cooling capacity increased by approximately 8.5%. This coupled with the noted improvements in COP and evaporator temperature will allow the unit to reach set temperatures faster. The system is now running 9% more efficient which will result in an approximate 9% reduction in energy consumption and associated cost. Additionally, the end-user can expect savings in on-going maintenance and expected equipment life since the unit is now operating more efficiently. While decibel levels were not measured, there was a noticeable reduction in compressor noise immediately following the installation. This is an indication that the increased lubrication qualities of **PermaFrost®** have benefited the compressor.

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45 DX → Supervalu 2

This test was administered by **PermaFrost Solutions**, County Clare, Ireland and Cross Refrigeration, in Dublin, Ireland in October of 2009. The test was conducted on a Maneurop Condensing unit MGZ100, serving chill display cabinets. In the case of Supervalu the unit's cooling capacity increased by approximately 10.47%. The system is now running 12.89% more efficient which will result in an approximate 13% reduction in energy consumption and associated cost.

46 DX → BMS/Dublin

The test was administered by Dalkia for Bristol-Myers Squibb, in Dublin, Ireland, on a 12 HP Refrigeration Unit used for Chemical Cold storage. This installation occurred in December of 2009. The Condensing Unit was a Copeland and the Evaporating Unit was an EX Rated Special. **PermaFrost® DX – Synthetic Oil Blend** was installed into the unit. In the case of BMS the unit's cooling capacity increased by 14.30% and an immprovement of 12.70% in COP. The system is now running approximately 13% more efficient which will result in an approximate 13% reduction in energy consumption and associated cost.

47 DX → Retrospective Performance and Safety Analysis

The goal of this report is to demonstrate the long term effects of **PermaFrost®** on DX systems in regards to the reduction of energy consumption, specifically the reduction in amp draw. **PermaFrost®** is installed once and lasts for the life of the unit. Its patented formula cleans the coils from the inside, enhances heat transfer, reduces wear and extends the life of the unit while using less energy. The units in this study were treated with **PermaFrost®** 9 years ago. Outside of annual maintenance, nothing has been done to these units. This case study involves 3 residential DX units that are 17 years old. The three units are manufactured by Rheem and are rated for 12 RLA. These units were treated with **PermaFrost®** in 2002. The amp draw readings for this report were taken in the fall of 2009 by a licensed HVAC service technician. All readings were taken at the service disconnect.

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48 DX → Sahara Tower

Test was administered by GreenWave Capital in Dubai, UAE. The purpose of this case study was to show the effects of **PermaFrost®** on a 3 ton Rheem DX Split unit(less than 3 years old) air-conditioning system at Sahara Tower I. The unit's cooling capacity increased by 15% and an improvement of 13% in COP. The system is now running approximately 13% more efficient which will result in approximately 13% less energy consumption.

49 CH → El Machetazo

Machetazo are a Panama based supermarket chain. **Powertron Global™**, Clean Air Panama & El Machetazo installed **PermaFrost®** in 2 of 3 chillers in Panama, Panama on April 29, 2010. Two York 200 ton chillers model number YSCBCBSI-CGC were treated. The savings in kWh over 5 months was 10.9%. Total kWh saving were 75,320 for the period at $0.16/kWh the saving to date is $12,051.20. El Machetazo and **Powertron Global™** are in the process of developing an implementation plan for the rest of the El Machetazo stores.

50 DX → Superquinn

Test administered by Streamline Enterprises & PermaFrost Solutions in July of 2006. Superquinn is an Irish based retail supermarket chain. The equipment treated was a Refrigeration 8 compressor pack (HT Application). In the case of Superquinn the unit's cooling capacity increased by an average of 10% and the COP improved 16%. The system is now running approximately 10% more efficient which will result in an approximate 10 % reduction in energy consumption and associated cost. Additionally, the end-user can expect savings in on-going maintenance and expected equipment life since the unit is now operating more efficiently.

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51 DX (side by side) → St John Properties

This pilot offered a unique situation for **PermaFrost®** in 2010. It involved 2 exact buildings side by side during the same exact time period. One building treated and one would be the control group or untreated. Both of these buildings have the exact same units (Trane 5 ton packaged) in which are exactly the same age and have the same runtime. Both building were vacant and neither building had any foot traffic, office equipment other than security lights that both ran exactly the same schedules. This unique opportunity eliminated normal operating variables for a typical office building. Weather is not a factor here because both units experienced the same exact conditions. This is pilot is about as close as one can get to a lab test in the field.

Delta T measurements were recorded along with analysis of the power bills which looks at energy consumption over time. The average runtime reduction for this pilot is 25.5% which is a direct energy savings at the unit while doing the same amount of work maintaining the indoor temperature settings. We expect to see 18-22% less runtime across a portfolio so this average is slightly higher than the average unit treated. The results of this demonstration are in line with the results we measure across the globe. Increasing the cooling capacity, reduces runtimes, extends the life of the system. Providing superior lubrication, and protecting the system from some of the common by-products of HVAC operation also aid in maximizing the life span of each unit treated with **PermaFrost®**.

52 DX → Lifestyle Family Fitness

The following analysis is a comparison between 2009 and 2010 from January through July. The same months in each year were compared even though only the Florida clubs have been treated with **PermaFrost®**. The clubs in Ohio and North Carolina will serve as control groups. Various sizes and makes of DX equipment were treated. The five-year savings projections are estimated exceed $3,000,000. Estimated return on investment is 160% per year based on performance in 35 clubs over 7 months. Lifestyle Fitness Family is on track to receive a 7-8 month initial payback.

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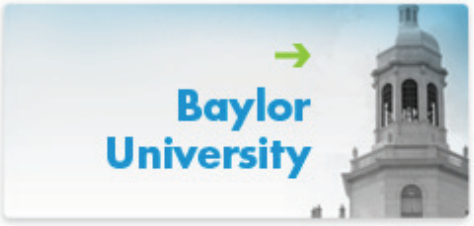
53 DX → Laureate International Universities

The test was Administered Jointly by EcoScience Solutions and Triad Mechanical in summer of 2010 in Baltimore, MD. The equipment treated was a 30 ton Carrier Rooftop Package Unit and a Carrier 20-ton RTU operating with VAV systems. The two RTU's treated showed significant improvements in Delta-T, increasing an average of 5.8° F across the two units. In regards to kWh savings, after just three months Laureate has already saved $5,915 off of their power bill versus what they would have normally paid for power if the systems were not treated with **PermaFrost®**. At a cost of $.126 per kWh, Laureate recouped their investment in less than three months. A savings in kWh of 18.7% was realized for the period.

54 DX → Glorius Rena

Powertron Global™ and **Uni Americas** installed **PermaFrost®** on a 25 year old 60 ton Daikin DX unit aboard the vessel "Glorious Rena" on August 9, 2010 in Reserve, LA. The unit is equipped with R-22 for refrigerant. A Delta T test was administered. Approximately 1 hour and 20 minutes later the delta had improved to 8 degrees.

55 DX → Baylor University



The unit for this pilot is a 15 ton Trane DX system used to a cool data center. This is a two stage system with two 7.5 ton compressors. The system is set on a humidistat and runs continuously, and did not cycle off during the entire pilot phase. The system self regulates and can unload as needed by running one compressor (stage 1), or increases output as needed by running the second compressor (stage 2). The unit is now running 18.5% more in stage one which is due to higher output. This allows the unit to unload and handle more heat and humidity on one stage. The unit is running 17% less in stage two which use significantly less power while only running on one Stage. The unit supply output was increased significantly in stage 2.

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56 DX → Ditek

Powertron Global™ installed **PermaFrost®** on April 12, 2010 in 18 DX units with R-22 and one small 1.5 ton R-410 unit. Baseline Delta T measurements were taken before installation. The average delta t split increased was 1.5 degrees within 2-3 hours of installation but these would increase as the product was allowed more time to seat itself into the system. The overall ('08 vs. '10 & '09 vs. '10) results averaged 14.3% in kWh savings off the total power bill.

57 DX → Sirata Beach Resort

Sirata Hotel in St. Petersburg, FL installed **PermaFrost®** in 98 small DX units in Building 4. The installation took place on August 31, 2010 and was completed on Sept 14, 2010. Most of the 1.5 ton split systems were manufactured by Goodman and the remaining were manufactured by Heil. All units utilized R-22 and the ages of the treated units ranged from 2 to 12 years old. The average Delta T improvement for the 4 units that we focused on for this analysis is 3.1 degrees. Every degree of Delta T improvement translates into a 3 – 4% savings off a customer's total power bill. Using a conservative 3% per degrees, The Sirata can expect approximately 9% reduction on their total power bill for the treated building. The Sirata will realize an ROI in approximately 12 months.

58 DX → On Demand Printing

PermaFrost® was installed in four units for On Demand Printing in Oldsmar, Florida in April of 2010. Two American Standard DX units that service the printing/processing area of the facility are 7.5 tons each and the other two Goodman units are 3 ton units servicing an office area. The two 7.5 ton units are approximately 2 years old and the two 3 ton units are 13 years old. All use R-22 refrigerant. The average savings after adjusting for weather is 6.6%. In this instance, **PermaFrost®** has prevented two 7.5 ton units from fully reaching their efficiency degradation. ASHRAE states that these units would have lost as much as 40% if left untreated over the unit's lifespan.

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59 DX (side by side) → USA Medical Center

Seven units were treated with **PermaFrost®** on 2 August, 2010 AT USA Medical Center, Mobile, AL. Three Nordyne DX Units at Vision Center (3, 3.5, and 4-ton), Two 10-ton Trane DX Units serving the Burn Unit, One 10-ton Trane DX Unit serving the Angio Center and One 20-ton Carrier DX Unit serving the Moorer Bldg were treated. **PermaFrost's** direct benefits were measured very effectively right at the unit by calculating Delta-T using Supco Temperature data loggers. Improvements of 3 – 5 degrees F in Delta T were recorded for the 7 units treated. An average savings of 8.2 % were realized at the Vision center and an average of 12.52% kWh savings for Moorer Bldg for the pilot period. The energy savings generated by the systems which have been treated with **PermaFrost®** will produce a return on investment for USAMC in just 4 months.

60 DX → Panama Canal Railway

Powertron Global™ and Clean Air Panama installed **PermaFrost®** for the Panama Canal Railway in their main office buildings. The equipment treated in this case study was 5 & 10 ton York, 2 ton Miller, 1.5 ton LG and two unnamed DX units. All were equipped with R-22. A total of 21 oz. of **PermaFrost® DX** was installed on October 7, 2009. Their average kWh savings over the 10 month period was 17.7%. At a rate of $0.16/kWh the total dollar savings for the period above is $4,524.80. The ROI for this office was 4.5 months

61 DX → Ducab; 6 Ton Split Unit

Test administered by Ducab & GreenWave Capital in Dubai, UAE, on a York 6 Ton Packaged Unit in the Staff Accommodation Kitchen in July of 2010. The unit was approximately 7 years old. In the case of Ducab, this unit's cooling capacity has increased by 21% and run-time energy consumption increased by 3%. These two measurements lead to an overall increase of 19% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP has resulted in the packaged unit providing much more cooling to the room and using less energy throughout the day.

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62 DX → Ducab; 10 Ton Packaged Unit

Test administered by Ducab & GreenWave Capital in Dubai, UAE on a York 10 Ton, Split Unit (approximately 5 years old) in the PVC Laboratory in July of 2010. The tested unit cools the PVC Laboratory and operates under a medium load factor with a 22°C set temperature in the room and extreme outdoor ambient conditions (humidity and heat). This unit is one of two similar cooling sources for the room. The second system was switched off throughout this demonstration. In the case of Ducab, the unit's cooling capacity increased by 17% with no increase in energy consumption. These two measurements lead to an overall increase of 16% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster allowing it to cycle down more frequently, leading to less energy consumption throughout the day.

63 CH → Ducab; 80 Ton Chiller Unit

Test administered by Ducab & GreenWave Capital in Dubai, UAE, on a SKM 80 Ton, Process Chillers at the PVC Plant in July of 2010. The purpose of this test was to show the effects of **PermaFrost®** on a 5 year old SKM process chiller. The tested unit cools the PVC Plant equipment and operates under a high load factor with a 45°F set water temperature and extreme outdoor ambient conditions (humidity and heat). This unit is one of two chillers cooling the equipment, however, on both measuring occasions the second chiller was not operating, due to insufficient load. In the case of Ducab, the unit is maintaining the chilled water temperature more consistently and now needs to provide less cooling capacity and is doing so with less energy.

These two measurements lead to an overall increase of 19% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster and allow system #2 to cycle down more frequently throughout the day.

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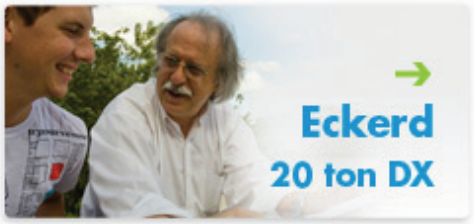
64 DX/Maintenance

→ Eckerd College; Bard AC Unit Service Call

The report is authored by Ed Catanzaro M.E. /C.E.M./C.M.C. who has the mechanical service contract with Eckerd College located in Tampa, FL area. This service call occurred in June 2010. This report was submitted to Norm Johnson who is the assistant facilities manager at Eckerd. The unit was not cooling even though the compressor was operational. Further diagnosis determined the problem to be excessive discharge pressure as a result of refrigerant oil that had become stacked in the interior of the condenser coil thus reducing the ability of the condenser to convert hot refrigerant gas into a sub cooled liquid. Initial temperature split was recorded as 12 degrees F. After 30 minutes this temperature difference had expanded to 22 degrees F. The difference now totaling 10 degrees is a direct benefit of the installation of **PermaFrost®**. This is an excellent example of **PermaFrost's** ability to remove trapped oil in the coil system and utilized as a maintenance product.

65 DX (side by side)

→ Eckerd College; 20 Ton



Powertron Global™ in conjunction with Cajun Mechanical Inc and Eckerd College agreed to evaluate **PermaFrost® DX** in September 2010 in Tampa, FL. The premise of this evaluation was proposed by Bill McKenna, who is the consultant to the president of Eckerd. His request consisted of evaluating two identical buildings with two identical HVAC systems (2 Trane units TTA180C400GA approximately 7 years old each), one to be treated and the other to be the control or the untreated facility. The subject buildings of the evaluation are student dormitories and are both fully occupied and were on the same daily schedules. All data logging and actions were being performed in the same time period for both buildings.

This evaluation is the conclusion of our third test conducted in 2010 for Eckerd. In regards to **PermaFrost®** direct benefits, the treated 20 ton unit produced a 7.6 degree change in the approach which equates to efficiency improvement of 22.8%. Over a one week period the Mills dorm (no PF) consumed 2298.5 kWh and the Prasch dorm (w/PF installed) consumed 1761.8 kWh. This one week difference equates to 23.3% less energy by the Prasch building.

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66 CH → Eckerd College; Water Cooled Chiller

Powertron Global™, Cajun Mechanical Inc and Eckerd College installed **PermaFrost®** in an Armacost York YCAS200 water cooled chiller on April 13, 2010. Eckerd College is located in Tampa, FL. This unit services 13 buildings all which are a part of the same water loop on campus. The unit is approximately 6 years old and is equipped with R-22 refrigerant. The savings documented in this chiller is $697.64 less energy consumed in one seven day period and a total reduction of 5,367.9 kWh. The Armacost York chiller use to require both of its compressors in order to reach set point. For example before treatment, both compressors would run when the ambient temperatures were 85 – 90 degrees F but now only one is necessary unless temperatures are 95 degrees F or above or when high heat loads are present then 2 compressors are necessary. Before the installation of P**PermaFrost®**, both Armacost and the Iota chillers would be necessary for the conditions 85 degrees or above.

67 DX → Thiess Services

Test administered by Thiess Services & GreenWave Capital in Dubai, UAE in July of 2010, on a Westinghouse 2 year old 1.5ton Split Unit at the TDIC Offices in August of 2010. The tested unit cools soft drink storage room and operates under a high load factor with a 20°C set temperature in the room and extreme outdoor ambient conditions (humidity and heat). This unit is the sole source of cooling for the room and does not provide sufficient cooling. As such, the unit runs 24hrs per day at maximum capacity. In the case of TDIC, the unit's primary cooling capacity increased by 8% and run-time energy consumption decreased by 4%. These two measurements lead to an overall increase of 12% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster allowing the system to cycle down more frequently throughout the day. Return on Investment for this unit is estimated at 6 months and will save and estimated 1.7 tons of CO2.

68 DX → Dubai Duty Free

Test administered by ETA, Dubai Duty Free & GreenWave Capital in Dubai, UAE in July of 2010. The purpose of this case study was to show the effects of PermaFrost® on a 3 year old SKM 35 ton packaged air-conditioning system. The treated unit cools the main distribution board (MDB) electrical room and operates under a medium to high

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Dubai Duty Free

load factor with a 22°C set temperature in the room and extreme outdoor ambient conditions (humidity and heat) outside. This unit is one of two cooling source for this room. The second similar unit was shut off during this demonstration. In the case of Dubai Duty Free, the unit's primary cooling capacity increased by 24% and run-time energy consumption decreased by 26%. These two measurements lead to an overall increase of 16% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster allowing sytem#2 to cycle down more frequently throughout the day.

69 DX

University of Sharjah 1

Test administered by Sharjah University & GreenWave Capital in Dubai, UAE in July of 2010. The purpose of this case study was to show the effects of **PermaFrost®** on a 4 year old SKM 8 ton packaged air-conditioning system. The treated unit cools the Dean's office and operates under a medium load factor with a 22°C set temperature in the room and extreme outdoor ambient conditions (humidity and heat) outside. This unit is the only cooling source for this room. In the case of Sharjah University, the unit's total cooling capacity increased by 6% and total run-time energy consumption decreased by 5%. These two measurements lead to an overall increase of 12% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster. The system is now running 15% more efficiently (under same conditions) and will consume approximately 15% less energy throughout the day.

70 DX

University of Sharjah 2

Test administered by Sharjah University & GreenWave Capital in Dubai, UAE in July of 2010. The purpose of this case study was to show the effects of **PermaFrost®** on a 4 year old SKM 10 ton packaged air-conditioning unit. The treated unit cools the conference hall and operates under a medium load factor with a 22°C set temperature in the room and extreme outdoor ambient conditions (humidity and heat) outside. This unit is the only cooling source for this room and is controlled by an electronic thermostat. In the case of Sharjah University, the unit's cooling capacity increased by 15% and run-time energy consumption increased by 4%. These two measurements lead to an overall increase of 10% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster using less energy. The system is now running 10% more efficiently (under same conditions) and will consume approximately 10% less energy throughout the day.

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71 DX → Tafe SA Automotive

This test was administered at Tafe, Automotive Department in South Australia, in October of 2010. The aim of this report is to examine the effects of **PermaFrost®** (sold as Envirotemp in Australia) in an existing operational Automotive Air Conditioning System and monitor, record and analyze any variation in these results from before and after the introduction of the product. All tests were conducted in the Automotive Workshop at the Elizabeth Campus of TAFE SA. The Ambient temperature was recorded at 30 minute intervals to ensure any variations would be considered in the results if necessary. Pre-treatment vent temps were 12.5C. After injecting **PermaFrost®** into the suction line, the post treatment readings was 7.4 C yielding a 5.1 C improvement in output. The results of the test carried out on this vehicle indicates a much improved Air Conditioning performance and also with a quieter operation of the compressor. The significance of this evaluation demonstrates **PermaFrosts's** ability to improve the cooling capacity of a system (output) without the need of more energy (input) thus proving its thermo dynamic claims.

72 DX → Residential Report

On September 17, 2010 a pilot installation of **PermaFrost® DX** was begun at the home of Danny Orlando, Regional Energy Star Manager for the EPA. His formal responsibilities include the administration for the Energy Star Program which encourages energy conservation through programs directed at companies, individuals and products. In addition to this, he has done many test pilot programs using his own home as the case study location. He has measured the kWh usage at his home for over a decade. Many projects such as energy audits, extra insulation and the installation of highly efficient appliances have been recorded by Mr. Orlando. He has put together a slide show about these measures which he presents to over 30 groups per year. After the product was installed and allowed seating time into the metal, the delta grew to 28.9 yielding a 2.8 degree improvement in output on Sept 20, 2010. Brett McAllister, 3rd party HVAC tech, also confirmed a 2 degree improvement in Delta T the day of Sept 17 in the early stages of the product seating itself before the conclusion of the pilot.

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73 DX → Midtown Athletic Club

Powertron Global™ in conjunction with EM3 Technologies and Cajun Mechanical installed **PermaFrost®** at Midtown Club in Atlanta, GA on October 5, 2010. The purpose of this report is to demonstrate the direct benefits of **PermaFrost®** in a cross section of units. A total of 323 tons of HVAC were treated. These units were all equipped with R-22. These units are approximately 20 years old. The direct benefit of **PermaFrost®** is improved cooling performance which allows a system to achieve set temperatures quicker and shut off or throttle back sooner. The two pieces of equipment that were monitored were 2 Trane Intellipak 60 ton model SXHCC604 DX units. The average delta t improvement for these two units was 2.4 degrees. These results were measured in less than 24 hours but these are expected to grow after allowing ample time for **PermaFrost®** to imbed itself into the metal especially in larger units such as these.

74 DX → Tendermeats

The purpose of the case study was to show the effects of **PermaFrost®** on a low temperature refrigeration system (Copeland Compressor R-22), at Tender Meats facility in Dublin, Ireland during May of 2010. A comparison of the two data collection periods indicates a significant increase in system performance after the installation of **PermaFrost®** into the system. In the case of Tender Meats the unit's cooling capacity increased by 11.73%. This coupled with the noted improvement of 11.31% in COP will allow the unit to reach set temperatures faster. The system is now running approximately 11% more efficient which will result in an approximate 11% reduction in energy consumption and associated cost. Additionally, the end-user can expect savings in on-going maintenance and expected equipment life since the unit is now operating more efficiently.

75 DX → Welcare Hospital

Test administered by GreenWave Capital at the Welcare Hospital in Dubai, UAE in May of 2010. The purpose of this test was to show the effects of PermaFrost® on a12 year old Rheem 4 ton split air-conditioning system. The tested unit cools the computer room and operates under a high load factor due to the heat load from the computers. The split unit is the only source of cooling for this room. In the case of Welcare Hospital, the unit's cooling capacity increased

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Welcare Hospital

by 12% and energy consumption decreased by 4%. These two improvements lead to an increase of 16% in Co-Efficient of Performance (COP), as measure by output/input. This increase in COP will allow the unit to reach the set temperature faster using less energy. The system is now running approximately 16% more efficient which will result in approximately 16% less energy consumption.

76 DX

EMIP Truck Study (US ARMY)

In July 2009, **Powertron Global™** supplied a refrigerated vehicle for the demonstration of the **PermaFrost®** product line's ability to reduce HVAC system kilowatt consumption by allowing the refrigerated unit to produce colder dryer air which results in reduced run-time. Reducing run-time reduces the kilowatts (kWh) needed to run the refrigerated system. Reducing the kWh required for operation reduces fuel necessary to run the generator.

77 DX

Ocular Center

Powertron Global™ and Clean Air Panama installed 44 ounces of **PermaFrost®** in the AC equipment in the eye surgery facilities for the Ocular Center in Panama, Panama in November of 2009. 5 months post data have reflected a kWh savings of 12.42%.

78 DX

Bank of America

In June of 2003, **Powertron Global™** and Power Quality Engineering installed PermaFrost in 2 rooftop units at a Bank of America location in Austin, TX. The total energy consumption for RTU 2 before **PermaFrost®** was 654 kWh over the baseline period. The total energy consumption after **PermaFrost®** was 524 kWh for the post period. The net reduction in energy consumption was 20% for the period. The total energy consumption for RTU 1 before **PermaFrost®** was 475 kWh over the baseline period. The total energy consumption after **PermaFrost®** was 405 kWh for the post period. The net reduction in energy consumption was 14.7% for the period. These units are still operating today without any failures.