AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR CONDITIONING ENGINEERS, INC.

the Champ

Monthly Newsletter of the
CHAMPLAIN VALLEY CHAPTER OF ASHRAE
Serving Vermont Since 1969

March 2011 | 1 | Vol.25 No.8

President's Message

I hope everyone is out finally enjoying some sun after this really long winter. Thanks to all who attended our March meeting, we had another great turnout. Big thanks to John Morris of Motivair and Mike Hayes of Smardt Chiller for their presentations.

The 2011 Nominating Committee announced the nominees for the 2011-2012 Officers and Board of Governors (BOG) positions. The nominations are as follows:

President - Mike Cook
President Elect - Tom Dacres
Vice President - Nathan Mascolino
Treasurer - Ken Secor
Secretary - Rob Favali
BOG - Peter Bailey
BOG - Dick Wilcox
BOG - Shawn LaBelle
BOG - Gretchen Langfeldt
BOG - Rachel Mascolino

If you know of anyone else that you would like to nominate for the above positions please contact the nominating committee members or myself. We will be finalizing the nomination list and voting on approval during April's meeting at VTC. Please submit any other nominees prior to April's meeting.

Just a reminder, we are now offering a display table outside our meeting room for all venders during our monthly meetings. The fee to do so will be $100 and all money raised will be given to ASHRAE Research Promotion. Please contact myself for more information.

I hope to see all of you at our next meeting on Wednesday April 6th which will be held at VTC's Judd Gymnasium. The first part of the night will be a webinar of ASHRAE's Hot Topic - ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, standard for design of high performance green buildings. Link - http://www.ashrae.org/members/page/2727. The second part of the night the students will be presenting on their design for the 2011 ASHRAE Student Design Competition. This year the design project is The Drake Well Museum located in Titusville, Pennsylvania the site where Edwin L. Drake drilled the first oil well in 1859. Link - http://www.ashrae.org/students/page/1852. Please come and join us in supporting the VTC Students.

Sincerely,
Shawn LaBelle
Chapter President

April 6th @ VTC's Judd Gymnasium

Technical Session 6 PM: ASHRAE Hot Topic Webinar: ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, Standard for the Design of High Performance Green Buildings

Dinner 7 PM

Main Presentation 7:30 PM: VTC ASHRAE Student Design Project: Drake Well Museum located in Titusville, PA

Meeting Cost
$30 CVC / $35 Non-Members / $10 ASHRAE Students
RSVP to Ray Hickey by Monday 03/28/11

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2010-2011 ASHRAE CVC MEETING CALENDAR

September 1st	October 6th	November 3rd	December 8th	January 5th
The Essex	**The Essex**	**The Essex**	**Hampton Inn**	**Hampton Inn**
BOG Meeting - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm HVAC Seismic Restraints Part 1 - Codes and Standards Part 2 - Applications Steve Fey - Mason Industries	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Tech Session - Chilled Beams / Krueger Main Presentation - Vermont Commercial Building Energy Code Tim Guiterman, Navigant Consulting	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Membership Promotion and Joint Meeting with Vermont Green Building Network (VGBN) USGBC - Lisa Whited - LEED Accreditation, Training & Maintenance	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Joint Meeting with RSES **Speakers** Jerry Kelman (Rawal – APR Control Devices) Walt Joncas (Hy-Save Technology – refrigeration pumping)
February 9th	**March 2nd**	**April 6th**	**May 4th**	**June 1st**
Hampton Inn	**Hampton Inn**	**Judd Gym at Vermont Technical College**	**Location TBD**	**End of Year Special**
BOG Meeting - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm **ASHRAE Distinguished Lecturer** Chris Mathis presenting on: 1. Energy Efficient Window & Fenestration Technologies 2. How Long Will It Last? – Addressing the Challenge of Sustainability	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm **Dinner** - 7:00 pm Presentations 1. John Morris of Motivair -Chiller water applications for data centers and critical environments 2. Michael Hayes of Smardt - Magnetic levitated chiller compressor technology	**BOG Meeting** - 4:30 pm **Presentation** - 6:00 pm ASHRAE Hot Topic Webinar: ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, Standard for the Design of High Performance Green Buildings. **Dinner** - 7:00 pm **Presentation - 8:00pm** ASHRAE Student Design Project, Drake Well Museum located in Titusville, PA Meeting Sponsored by Vermont Technical College (VTC) Student Chapter	**Site Tour** **Location TBD**	Location and Topic TBD

March Meeting First Presentation

Technology Transfer

I would like to take this opportunity to thank all ASHRAE members who attended last month's meeting. Thank you to our presenters, John Morris of Motivair who presented on chilled water applications for data centers and Mike Hayes of Smardt Chiller Group who gave a presentation on magnetic bearing compressors.

April's program will feature an ASHRAE "Hot Topics" webinar on ASHRAE 189.1 – 2009, Standard for the Design of High Performance Green Buildings presented by Presidential Member Kent Peterson, the past Chair of SSPC 189.1. The ASHRAE "Hot Topics" is a new pilot program being initiated by ASHRAE for its member chapters. These video presentations will feature a presentation by a top notch speaker on a current or timely topic. When fully implemented three to six hot topic presentations will be taped each spring and then made available to chapters via the ASHRAE webpage. Feedback from our members would be beneficial to the implementation of this program as well as the selection of future presentation topics. Future presentations being considered are updates on standards 90.1 and 62.1, Building EQ and ASHARE Presidential Themes.

After dinner our hosts will give a presentation on their ASHRAE design project.

A reminder to members planning on attending April's meeting that will take place at VTC hosted by the ASHRAE student chapter. Please come down to VTC and show support for our students.

BOG Meeting Minutes

Mar. 2nd, 2011 BOG Meeting Minutes

Date:	3/2/11
Location:	The Hampton
Time Called to Order:	4:35pm
Called to Order By:	Shawn LaBelle, President.
Minutes Recorded By:	Nathan Mascolino, Secretary

ATTENDANTS

Shawn LaBelle	Vermont Mechanical
Mike Cook	ARC Mechanical
Dick Wilcox	VHV
Tom Dacres	VHV
Nathan Mascolino	VHV
Peter Bailey	DEI

LAST MEETING MINUTES

Motion to approve Feb, 2011 meeting minutes was put forth by Mike C. and seconded by Peter B., motion passed.

OFFICER REPORTS

President Report/Chapter Operations: Shawn Labelle

Shawn reported that the nominating committee has completed a list of nominees for next years position. Shawn will read the nominations during the main meeting.

Shawn reported that the web page has been updated.

There was discussion on the newsletter, and it was suggested that the resolution on the business cards should be increased. Shawn will mention that to the new editor.

Shawn reminded everyone to update their PAOE points. The main focus of the Apr. BOG meeting will be to review the PAOE points.

Steve Poole went to the Engineering week banquet and will speak during the main meeting about it.

The scholarship deadline will be extended from March 21, to March 28. The BOG will vote on the past presidents award during the Apr. meeting. Shawn will send the application out to the board and has asked that anyone who has a contact at a university pass it along.

Shawn reported that Nathan Mascolino is registered to attend the YEA Weekend in Denver Apr. 1-3 There was discussion about the possibility of also sending Rachael Mascolino to the YEA weekend.

A motion was made by Mike C. to send both Nathan and Rachael to the YEA weekend for a sum not to exceed $2000.- the motion was seconded by Peter B. Motion Passed.

Nathan will check to see if the registration is still open, and if Rachael would be interested in attending.

Shawn will take some photos of the main meeting this month to submit to the newsletter.

There was discussion regarding the ASHRAE student chapter trip to the Vegas ASHRAE show. Due to some registration confusion the students were unable to attend the events they had planned on attending. The BOG reviewed the spreadsheet the students send with their request and determined that $732.- of the money the CVC chapter donated to their trip should be returned to the chapter because the events the money was intended for were not attended. Shawn will contact the student chapter and request $732.- Shawn will forward any communication to the board.

Shawn reported that he had sent the distinguished lectures a VT gift basket as a thank you.

Shawn suggested that over the next few meetings the board starts to discuss possible meeting topics for next year.

President Elect: Mike Cook

Mike reported that the Apr meeting will be held at VTC. The first topic will be an ASHRAE webinar on the new 189.1 Standard. The second part of the meeting will be the students presenting on their ASHRAE project.

Mike reported that the May meeting will be a tour of the heritage flight facility. There will be a follow up at the Hampton at 7:00pm.

Mike reported the June meeting is still up for discussion. The topic was tabled until the next meeting.

Vice President/MembershipChair Report: Tom Dacres

Tom had nothing to report.

Treasurer Report: Ken Secor

Ken's full monthly report will appear in the newsletter.

Secretary Report: Nathan Mascolino

Nathan had nothing to report.

Resource Promotion: Sandy Laflamme

Sandy was not in attendance.

History: Gretchen Langfeldt

Gretchen was not in attendance.

Reception: Ray Hickey

Ray had nothing to report.

Refrigeration: Peter Bailey

Peter had nothing to report.

NEW BUSINESS

No new business.

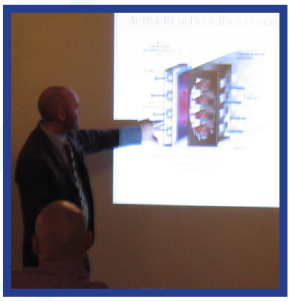
MEETING ADJOURNED

Motion to adjourn made by Tom D., seconded by Nathan M. Meeting adjourned @ 5:45 PM

These minutes are the writers understanding of the discussions involved. If there are any exceptions taken, or omissions, please notify the writer immediately.

March Meeting Photos...

First Presentation



1st Presenter John Morris of Motivair

Pete Bailey Presenting ASHRAE Refrigeration Comfort Cooling Award to Mary Jane Poytner of Efficiency Vermont

Second Presenter Mike Hayes of Smardt Chiller

General Meeting Minutes

Date: 3/2/11
Location: The Hampton Inn
Minutes Recorded by: Nathan Mascolino, Secretary
Attendance: 37

ATTENDANTS

Scott Alexander	LN Consulting
Jere Berger	Tcorp Inc
Pete Bailey	Dodge Engineering
Phil Bresnahan	Vermont Mechanical Inc.
Nigel Churchhill	Vermont Heating & Ventilating
Mike Cook	ARC Mechanical
Heather Condon Smith	Efficiency Vermont
Tom Dacres	Vermont Heating & Ventilating
Carmine DeFeo	Guy DeFeo Company
Keith Downes	Efficiency Vermont
Rob Favali	Dubois & King
Bill Gregory	L.J. Early Company
Corey Griffiths	Vermont Mechanical Inc.
Scott Harrington	Vermont Gas
Ray Hickey	Advanced Comfort Systems
Jason Hudspath	Thermal Environmental Sales
Jonathan Jordan	Advanced Comfort Systems
Ray Keller	Vermont Gas
Steve Kreigh	Mylan Technologies
Shawn LaBelle	Vermont Mechanical
Jim LaVallee	Vermont Mechanical
Doug Maddox	Maddox Energy Consulting
Nathan Masoclino	Vermont Heating & Ventilating
Rachael Masoclino	Efficiency Vermont
Bill Moore	Tcorp Inc.
Steve Poole	Vermont Heating & Ventilating
Mary Jane Poytner	Efficiency Vermont
Martha Soule	Vermont Heating & Ventilation
Mike Spasyk	Dubois & King
Nick Thiltgen	Efficiency Vermont
Harris Unger	Advanced Comfort Systems
Rob Ward	Vermont Heating & Ventilation
Dick Wilcox	Vermont Heating & Ventilating
Tom Zoller	Trane
Mike Hayes	Smardt Chillers
John Morris	Motivair Chillers
C. Cody Lezak	Efficiency Vermont

GENERAL MEETING:

TECH SESSION:

John Morris of Motivair spoke about how to successfully use free cooling, and heat recover in the conditioning of both large and small scale data centers.

MAIN PRESENTATION:

Mike Hayes of Smardt Chiller gave a presentation on magnetic bearing technology and how it pertains to HVAC compressors.

During the break between speakers Shawn read the nominations for the officer positions next year that the nomination committee provided. They are as follows.

President	Mike Cook
President Elect	Tom Dacres
Vice President	Nathan Mascolino
Treasurer	Ken Secor
Secretary	Rob Favali
BOG	Peter Bailey
BOG	Dick Wilcox
BOG	Shawn LaBelle
BOG	Gretchen Langfeldt
BOG	Rachael Mascolino

Nominations are open for one month. Officers will be voted in during the April meeting.

Peter Bailey gave an award to Mary Jane from Efficiency Vermont for her work on the project that the CVC ASHRAE chapter submitted for (and won) the comfort cooling award.

Steve Poole gave the chapter an overview on the intro speech he gave at the engineering week banquet. Steve repots it was an over all good event, and that ASHRAE should continue to submit nominations for the Engineer of the year.

The Hampton Inn provided a nice facility and served a fine meal.

These minutes are the writers understanding of the discussions involved. If there are any exceptions taken, or omissions, please notify the writer immediately.

Student Activities Report

VTC Chapter
Committee Chair: Shawn LaBelle
Student Chapter Advisor: Chris Reilly

I want to congratulate Stephen Smith and Dan Aubin, they have been selected as our 2011 VTC ASHRAE Award recipients. They will both be receiving $250 to put towards their school expenses. Each year the Champlain Valley ASHRAE Chapter votes on a sum of money to be allocated to our VTC ASHRAE Award. The faculty of the VTC Architectural & Building Engineering Technology department select an individual that is an active ASHRAE Student Member, has expressed great interest in the HVAC&R field and contributed to the VTC Student Chapter.

Just a reminder the 2011 ASHRAE Champlain Valley Past President Memorial Scholarship due date has been extended to March 28th, 2011. Please make sure to have those submitted to Shawn LaBelle either through mail or email by the due date. The application is posted on our website under the student chapter section.

Thanks!
Shawn LaBelle

Treasurer's Report

As of today, March 17th, not insignificantly St. Patrick's Day, 2011, all bills are paid and our TD Bank checking account balance is $16,330 - up from last month by $358.

Roughly a third of our newsletter advertisers have paid in full. Because these funds are earmarked for our scholarship commitment, the benefits derived are significant.

May the road rise up to meet you. May the wind always be at your back. May the sun shine warm upon your face, and rains fall soft upon your fields - even here, in still snowy Vermont...

Ken Secor, Treasurer

VTC ASHRAE Student Chapter 2010-2011

Refrigeration EEV - Part 1

Too all,
As a member of the Refrigeration Service Engineers Society (RSES) I get the opportunity to view some great articles from their monthly journal and would like to share this one with you. “As featured in RSES Journal’s December 2010 issue.” By Dave Demma, CM

This month will be Part 1 and next month Part 2

Repeatability and the EEV - Part 1

The EEV’s ability to repeatedly provide a constant amount of superheat, with minimal variation, at the outlet of the evaporator allows a system to maintain maximum efficiency and consistency in performance.

System performance is all about repeatability. There are several keys to keep a refrigeration (or air-conditioning) system operating at peak efficiency. In addition to selecting the correct equipment and components for the application, peak efficiency occurs by:

- Maintaining the suction-line pressure drop at an absolute minimum. This begins with correct piping design and installation, and is then sustained with proper maintenance. Regular maintenance ensures restricted suction filters or compressor inlet screens are not contributing to excessive pressure drop;

- Setting all of the system parameters to those specified by the design criteria (commissioning). Included in this broad point is the elimination of twin killers of compressor capacity—high compression ratio (ratio between the absolute discharge pressure and the absolute suction pressure) and high suction-vapor temperature; and

- Scheduling thorough maintenance regularly to ensure that the heat-transfer surfaces of the evaporator and condenser are free of efficiency-inhibiting dirt, debris and scale.

While the subject of this article is electric expansion valves, it is appropriate to briefly discuss the negative effects of the twin killers of compressor capacity mentioned above, as this helps to lay the foundation for the value in utilizing an EEV.

The function of the compressor is to take a volume of low-pressure vapor and compress it into a high-pressure vapor. As such, compressors are nothing more than a volume pump. The total theoretical volume-pumping capacity of a compressor in cfm can be calculated with the following equation:
→πR2 x piston stroke x number of pistons x motor rpm.

As with any mechanical device, compressors are subject to inefficiencies in operation because of elements such as piston ring condition, seating surface on the compressor’s suction and discharge valves, clearance volume, and operating conditions. These factors will all affect compressor efficiency. Multiplying the theoretical volume-pumping capacity by the compressor efficiency will yield the actual volume-pumping capacity.

While compressors can be rated in cfm, Btuh capacity at a given condition or even referred to by the horsepower of the motor driving the compressor; it is the refrigerant mass flow in lb/min that is of greatest relevance. Refrigerant mass flow is a function of the actual volume-pumping capacity and the thermodynamic properties of the refrigerant in use, along with the conditions at which the system is operating

Capacity Killers

Excessive compression ratio — When the piston reaches the top of its stroke, a distance or clearance remains between the top of the piston and the bottom of the valve plate.

There is a safety factor to ensure that the piston never makes contact with the valve plate. The volume of vapor that is contained within this clearance is referred to as the clearance volume. How it affects compressor efficiency is as follows:

This vapor remaining in the clearance volume is at discharge pressure. Its presence prevents any new low-pressure vapor from entering the cylinder until it can be re-expanded to a pressure slightly lower than the suction pressure. This only occurs as the piston travels downward in its stroke, with the increase in cylinder volume reducing the pressure of the clearance volume vapor. The portion of piston travel dedicated to re-expanding the clearance volume vapor is not doing any useful work, and it requires electrical energy to drive the compressor motor to accomplish the re-expansion. This inefficiency results in a corresponding reduction in the compressor's capacity, reducing the refrigerant mass-flow output.

Now, the technician can take steps to reduce this inefficiency. The amount of wasted piston travel is directly proportional to the difference between the discharge pressure and the suction pressure—also known as compression ratio. Compression ratio (the ratio between the absolute discharge pressure and the absolute suction pressure) is a meaningful way to assess the difference between these two pressures. By reducing the compression ratio (maintaining the lowest possible discharge pressure and the highest possible suction pressure), the inefficiency from re-expanding the clearance volume vapor will be kept to a minimum.

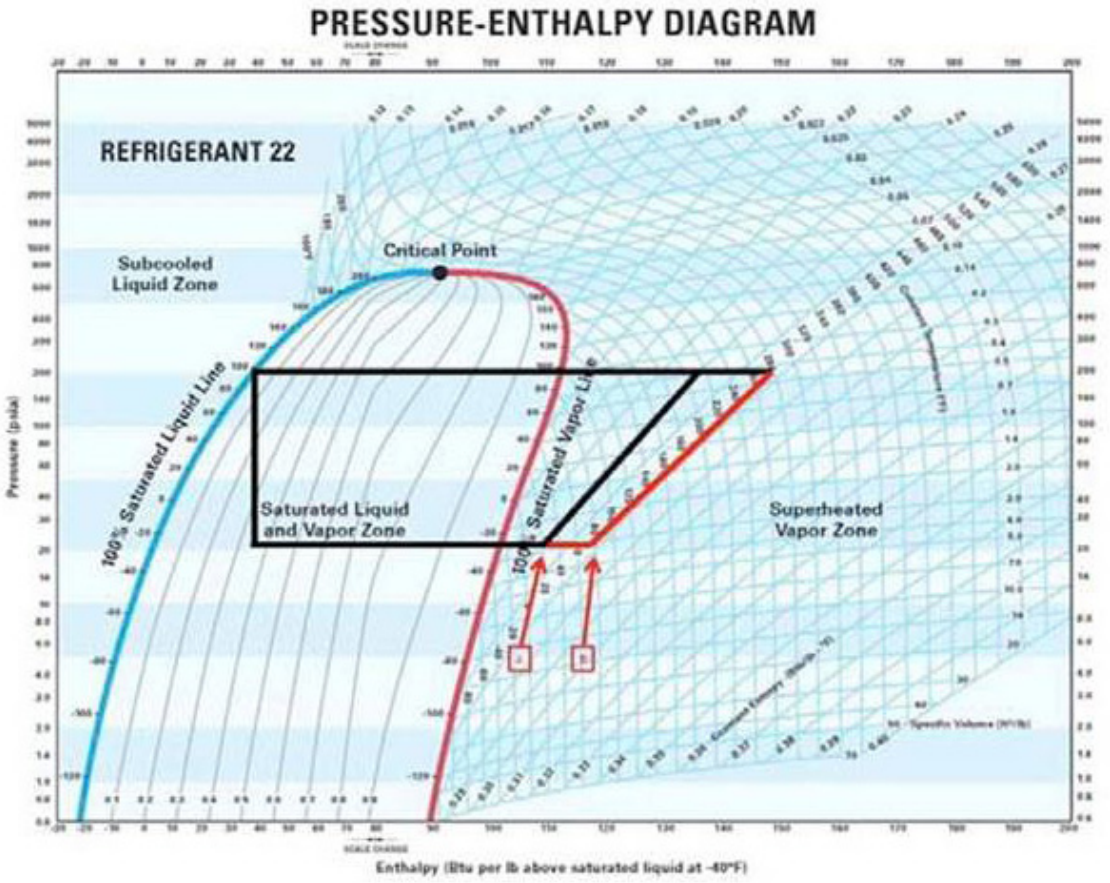


Figure 1
Several steps are required to determine a compressor's mass flow; plotting specs on a pressure-enthalpy diagram is one of them.

Excessive suction-vapor temperature — With refrigerant mass flow being the relevant capacity rating point in the compressor's operation, it becomes important to understand how the system's operating conditions can have an impact on this value. Note the pressure-enthalpy diagram in Figure 1, where a system operating at -30°F suction and 100°F condensing has been plotted. The system is shown with the compression cycle starting with suction vapor at 20°F (point A in red) and also 75°F (point B, in red).

The nearly horizontal lines to the right of the saturated vapor line are lines of specific volume, and measured in ft³/ lb. The specific volume at points A and B are 2.9489 ft³/lb and 3.3186 ft³/lb, respectively. By taking the inverse of the specific volume, the vapor's specific density in lb/ft³ can be determined (0.33911 and 0.30133, respectively). In layman's terms this will reveal the refrigerant mass (in lb) for each ft³ of vapor. This is relevant in determining the compressor's mass flow capacity.

For example, assuming an eight-cylinder compressor with a piston bore/stroke of 3 in. x 4 in. operating at 3,600 rpm at 80% efficiency, the actual volume pumping capacity would be π (1.5 in.²) x (4 in.) x (8 cyl/rev) x (3,600 rpm) x (80% efficiency) x (ft³/1,728 in³) = 377 cfm. The refrigerant mass flow can then be calculated by multiplying the actual cfm x specific density. Using the compressor cfm calculated above, along with the specific density values from the system plotted above, the refrigerant mass flows are 127.84 lb/min and 113.60 lb/min—an approximate 12% reduction in compressor capacity due to higher vapor temperature.

The TEV's Job

Given a liquid's high density compared to vapor and the large quantity of heat required to change a liquid into the vapor state (latent heat of vaporization), a liquid refrigerant at saturation is a very efficient heat-transfer medium. As such, an evaporator that has a mixture of saturated liquid and vapor flowing through its entire length would provide the highest operational efficiency. This is not practical because it would require operating with 0°F superheat at the evaporator outlet, which means a high probability of liquid floodback at the compressor inlet - great for evaporator efficiency, but not so great for the compressor.

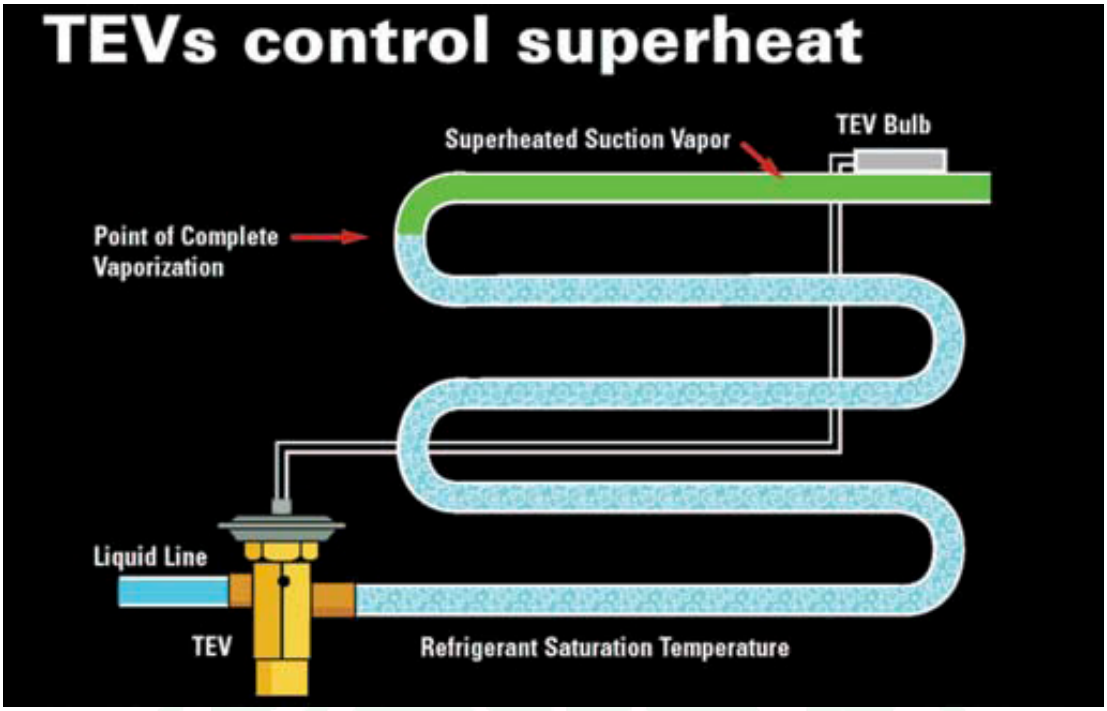
(Note: Even in applications requiring lengthy suction-line runs, where a mild amount of liquid floodback might boil into a vapor before reaching the compressor inlet, any refrigeration effect that takes place downstream of the evaporator outlet provides no additional cooling capacity to the refrigerated space. Again in layman's terms, liquid floodback adds load - and the corresponding electrical consumption - to the compressor, while also putting the compressor's safety at risk. A classic double whammy).

A compromise to evaporator efficiency is required to protect the compressor from the damaging effects of floodback. This is achieved by maintaining a marginal superheat condition at the evaporator outlet. Figure 2 shows the TEV receives high-pressure, high-temperature liquid from the receiver and experiences a reduction in pressure when flowing through the TEV's port. The lower pressure causes some portion of the liquid to flash vapor, which reduces the remaining liquid to the corresponding saturation temperature for the pressure.

This mixture of saturated liquid and vapor flows through at the evaporator tubing, absorbing heat from the refrigerated space and causing the remaining liquid to boil into a vapor. At some point, the last molecule of liquid boils into a vapor (the point of complete vaporization) with the remainder of the evaporator dedicated to superheating the refrigerant vapor.

Evaporator ratings are determined by their tubing size, fin spacing, overall dimensions of the evaporator coil, and the TD at which they are applied (with TD being the difference between the air entering the evaporator and the saturation temperature of the refrigerant in the evaporator). Evaporator capacity is proportional to the TD; increase the TD from 10°F to 20°F, and the evaporator capacity will be doubled. Of course, these

Figure 2
Refrigerant flow in an evaporator



capacities are all based on the evaporator being fully supplied with enough saturated liquid refrigerant to achieve the manufacturer's rated capacity.

It is the TEV's job to ensure that the evaporator is operating at the manufacturer's rated capacity. It does this by supplying the evaporator with the necessary amount of saturated liquid refrigerant to meet the varying demands of the refrigerated space load; this is achieved by maintaining a constant superheat at the evaporator outlet. Keep in mind that the portion of the evaporator dedicated to achieving superheat is providing very little heat transfer, so the superheat should be kept at a minimum. On the low-temperature system used in the example above, it would be appropriate to set the superheat somewhere between 4°F and 6°F - low enough to maximize evaporator efficiency, but high enough to ensure no floodback.

Effects of High Superheat

Now, what happens to evaporator efficiency when the TEV is set to maintain a high su perheat? The tangible result is that the point of complete vaporization moves closer to the outlet of the TEV, resulting in a larger portion of the evaporator dedicated to superheat the vapor - or a smaller portion of the evaporator dedicated to effectively transferring heat from the refrigerated space. Simply put, high superheat reduces the effective size of the evaporator the evaporator capacity loss from operating at a high su¬perheat while maintaining the evaporator at its design operating temperature will result in excessive temperatures in the refrigerated space. This can be overcome by lowering the suction pressure, operating at a lower saturation temperature in the evaporator. This increases the TD, which will increase evaporator capacity, and allows the system to operate at the design temperature. The typical supermarket compressor rack will have sufficient backup compressor capacity to achieve this, but at what cost? The high superheat yields in a higher vapor temperature at the compressor inlet, resulting in a loss in compressor capacity. The lower suction pressure yields in a higher compression ratio, again resulting in a loss in compressor capacity.

Would it not be a better solution to set the TEV to the desired superheat set point and allow the system to operate at the highest possible suction pressure? Of course, but there are a few potential roadblocks to achieving this, such as:

1. A lack of understanding on the technician's part regarding superheat and how to set the TEV;

2. The time involved in setting the TEV. In a typical supermarket there might be as many as 100 TEVs. Given the lengthy amount of time required to set all of the TEVs, the technician might settle for achieving design temperatures without setting TEV superheat; or

3. The limitations of the TEV. As a mechanical device it has a range of operation that limits its effectiveness at low-load conditions. In addition, the performance of a mechanical TEV will offer varying superheat settings as the conditions change—load, ambient, conditions of the entering-liquid refrigerant, etc.

The EEV's Job

As the opening sentence states, system performance is all about repeatability. "Repeatability of what?" you might be asking. The answer to this question finally introduces the EEV, which has the ability to repeatedly provide a constant amount of superheat at the outlet of the evaporator with a minimum of variation and under the extreme's of varying system conditions and ambient and load conditions. To do so will allow the system to maintain maximum efficiency and consistency in performance.

A good comparison of the EEV's ability is shown in Figure 3, where its superheat characteristics are contrasted with those of a mechanical TEV, on the same refrigerated display case operated under constant conditions in a laboratory-controlled environment. Figure 4 shows the comparative results of the percentage of

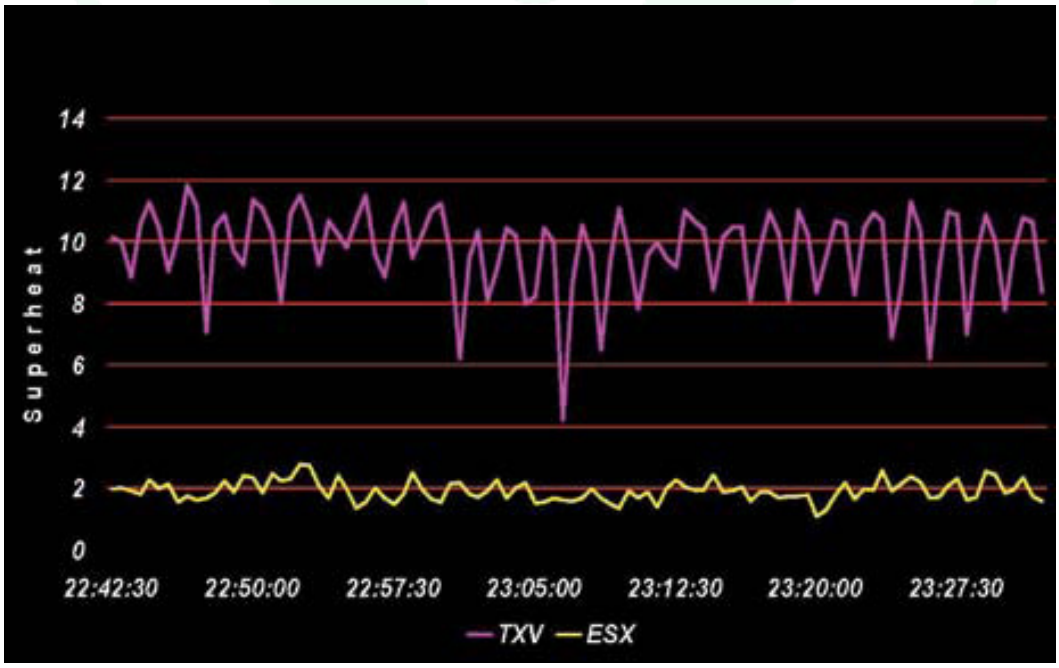


Figure 3
Superheat characteristics of an EEV and TEV

runtime the EEV and TEV were each within a certain ± value of setpoint. Contrast the EEV being within ±1°F superheat nearly 90% of the time, whereas the mechanical TEV was within ±1°F superheat a meager 35% of the time. This is quite a contrast between two valves that have the same function.

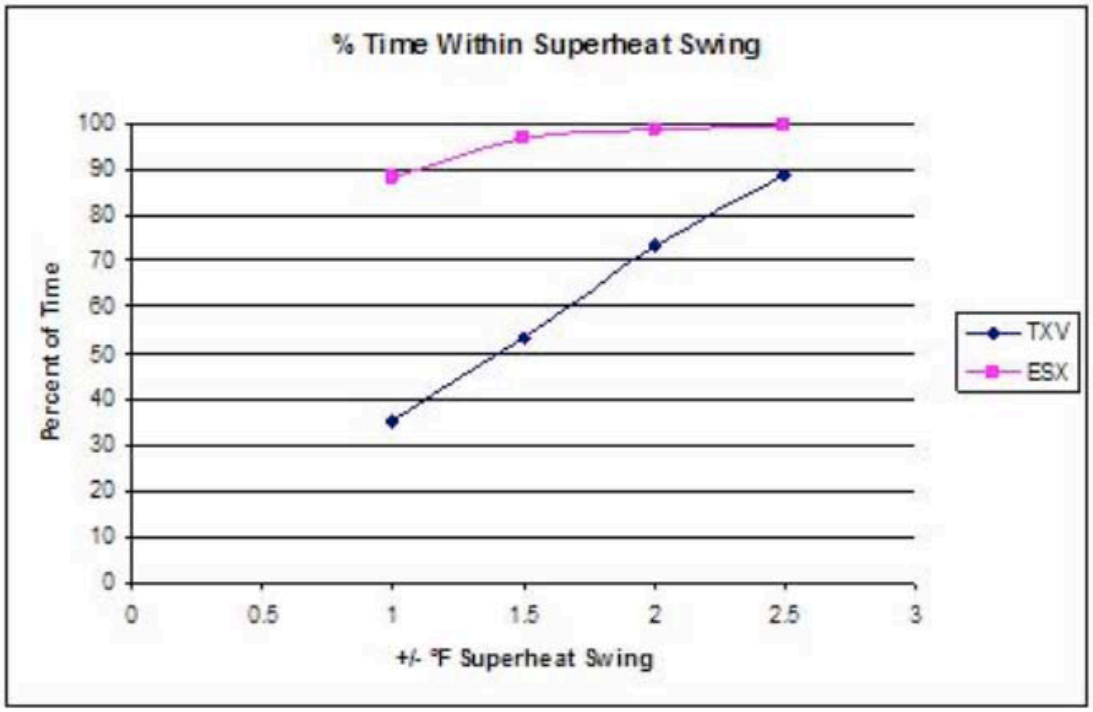


Figure 4
Percent time within Superheat Swing

Part 2 of Refrigeration EEV will appear in next month's newsletter.

Resource Promotion

By Sandy LaFlamme

The CVC RP webpage will be up and running soon and I hope that you will check it out and provide me with feedback for improving it. You can get to it by going to www.ashraevt.com and clicking on the RP link at the left of the home page.

Now that it will be easier for people to donate on-line using a link from the new CVC RP webpage, we'll be starting our spring campaign calling soon. You're still welcome to donate by mailing a check, as well, of course. Please make it payable to ASHRAE Research Promotion and mail it either to ASHRAE Research Promotion, 1791 Tullie Circle, Atlanta, GA 30329 or to Sandra LaFlamme, Efficiency Vermont, 255 South Champlain Street, Burlington, VT 05401. Our Chapter gets credit for your donation regardless of your method of donating. Thank you and Happy Spring!

Mission Statement

ASHRAE will advance the arts and sciences of heating, ventilation, air conditioning, refrigeration and related human factors to serve the evolving needs of the public and ASHRAE members.

Vision Statement

ASHRAE

~ Will be the global leader in the arts and sciences of heading, ventilation, air conditioning & refrigeration.

~ Will be the foremost, authoritative, timely and responsive source of technical and educational information, standards and guidelines.

~ Will be the primary provider of opportunity for professional growth, recognizing and adapting to changing demographics, and embracing diversity.

Presidential Award of Excellence Totals

Presidential Award of Excellence (PAOE) is the point system ASHRAE Region and Society use to help track the Chapter's activities. The chapter gets points in the below categories for activities that we do throughout the year. The awards banner that you see at the meetings represents CVC's accomplishments over the years. Below are definitions of what some of those awards are. If you want to know more about PAOE check out the www.ashrae.org website and do a search for the 2006-2007 PAOE newsletter.

End of Year Awards Available to the Chapter:

PAOE: Minimum in five of the six categories

Special Citation: Minimum in 5 of the 6 categories with a minimum total of 4600 points

STAR: PAR in all categories

Honor Roll: PAOE for at least 4 consecutive years

High Honor Roll: STAR for at least 4 consecutive years

Premier: PAOE every year since the chapter's inception or since 1970; minimum of 4 years; chapter's first year is excluded

Sustainability Activities Award: A Chapter Sustainability Award in the form of a certificate is available for each chapter that obtains a total of at least 200 points from the items listed under Sustainability

Activities in the Chapter Operations category of PAOE. The Chapter with the highest PAOE Sustainability point total will receive a Regional award in the form of a glass plaque and a certificate.Level 1 = less than 100 members; Level 2 = 100-249, Level 3 = 250-449, Level 4 = 500 or more.

Category	PAR	(2010-11)
Membership Promotion	800	860
Student Activities	500	445
Technology Transfer	850	400
Research & Promotion	1050	715
History	200	0
Chapter Operations	500	455
Chapter TOTAL	**3900**	**2875**

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