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What has happened so far...

- First met June 2006 in Quebec City
- Membership 16 Voting Members including 5 Producers,
 Users and 6 General Interest, also 6 Non Voting members
- Emphasis on Supermarket Refrigeration
- Written with intent to be included in building codes
- •2 Public Reviews with a 3rd upcoming



What's in it...

Purpose –

This standard establishes practices and procedures that will reduce inadvertent release of halogenated refrigerants.

Scope –

- The practices and procedures in this standard cover release reduction of halogenated hydrocarbon and halogenated ether refrigerants in the following circumstances:
- from stationary refrigerating, air-conditioning, and heat-pump equipment and systems;
- during manufacture, installation, testing, operation, maintenance, repair, and disposal of equipment and systems.



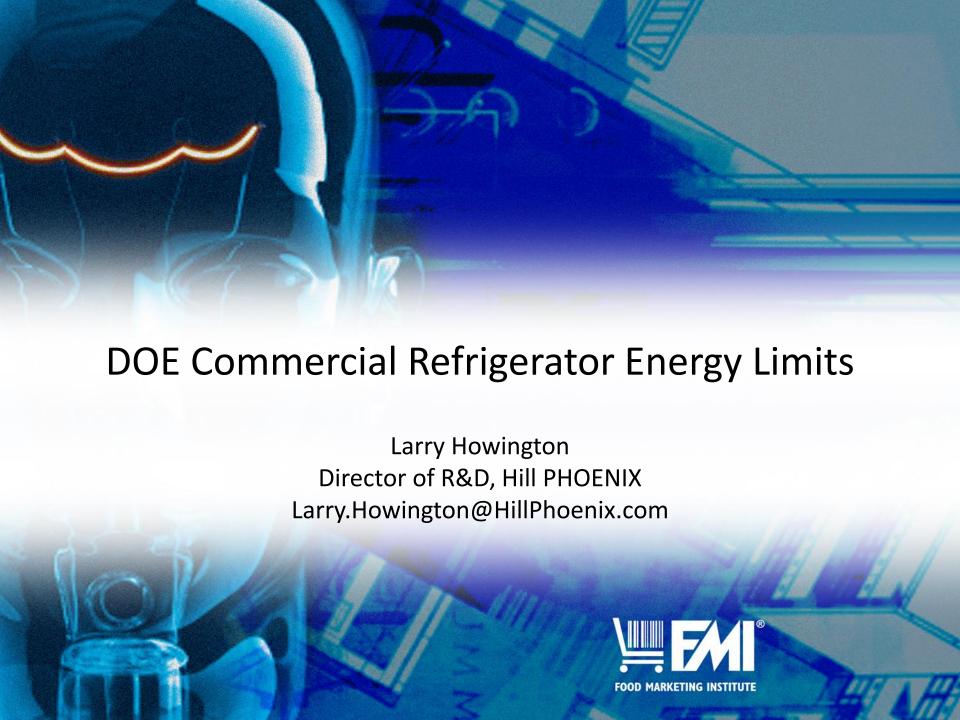
Highlights

- Single flare fittings not allowed
- 4.3.3 Tubing in a case must be supported
- Tethered caps
- 4.11 Systems over 500 Lbs need to "alert" owner of refrigerant release
- 6.1 Factory Leak testing & Leak rate spec
- Section 7 Installation
- Section 8 Service and Operation
- Annex Not part of the Standard, but an FYI



Where is it going from here...

- 3rd Public review...**should** complete the process
- ASHRAE then would publish the Standard and the intent is that Building Authorities and others could adopt and make it Code or part of Building Requirements





Energy Policy Act (EPACT) 2005

Definition and Origin

- AHRI negotiated EPACT language with Energy Advocacy Groups (primarily ACEEE¹)
 - Why? Preempt individual states from enacting unmanageable regulations
- Mandates maximum energy limits for display cases & storage cabinets
 - Energy Limits on Closed, Self-Contained Cases are set [Jan 1, 2010]
 - DOE was mandated to set energy limits for remaining products by 1/1/2009
 [effective Jan 1, 2012]
 - DOE contracted Navigant as a consultant to perform energy limit analysis/definition





EPACT 2005 Impact

Closed, Self-Contained Cases (Effective Jan 1, 2010)

Maximum daily energy consumption (kwh/day)

Refrigerators with solid doors 0.10V + 2.04 Refrigerators with transparent doors 0.12V + 3.34 Freezers with solid doors 0.40V + 1.38

Freezers with transparent doors 0.75V + 4.10

V = Volume of Case

These energy limits represent a 30% to 50% reduction over current baseline product.

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DOE Energy Limits are Assigned to Product Families

DOE Naming Convention

"(Case Structure). (Condensing Unit Configuration). (Rated Product Temperature)"

Case Structure

- Orientation
 - Vertical
 - HoriZontal
 - Semi-Vertical
- **OP**en
- Closed
 - Transparent
 - Solid (storage)

Examples:

Door display case = **VCT**

Multi-deck dairy case = **VOP**

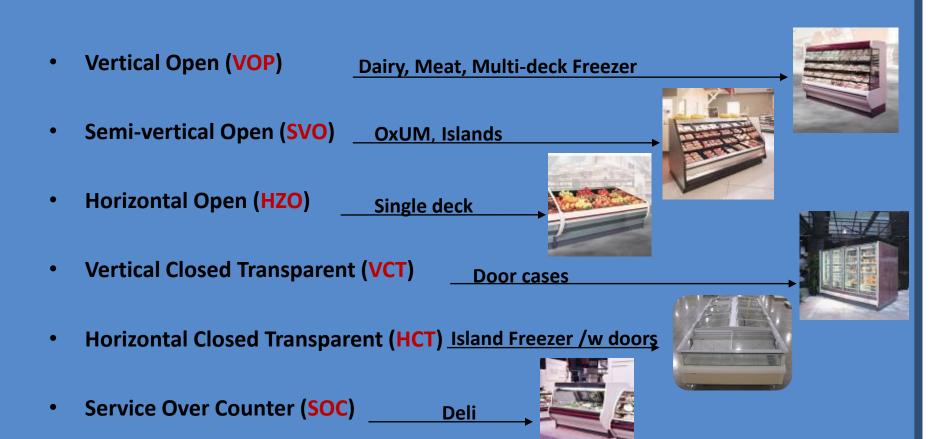
Island Freezer = **HZO**



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DOE Product Family Definitions – Case Structure Examples



Family Definitions were key to manageable rulemaking.



Product Family Definitions

Condensing Unit Configuration & Rating Product Temperature

Condensing Unit Configuration

- Remote Condensing (RC)
 - DX only for now; secondary coolant excluded
- Self-contained (SC)

Rating Product Temperature

- Medium Temperature (M) [38°F]*
- Low Temperature (L) [0°F]*
- Ice Cream Temperature (I) [- 15°F]*
 - Does not apply to cases that can operate at frozen and ice cream temps by making set point adjustments

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DOE Definitions

Total Display Area (TDA)

TDA is sum of the projected viewing areas for product

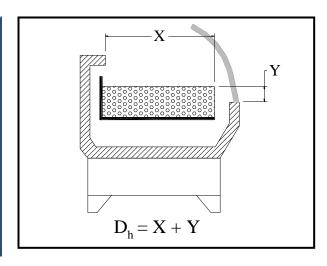
$$TDA = D_h \cdot L + A_e$$

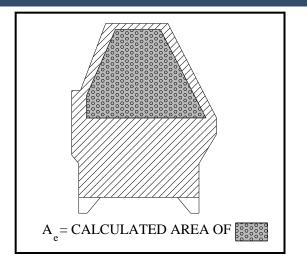
Where

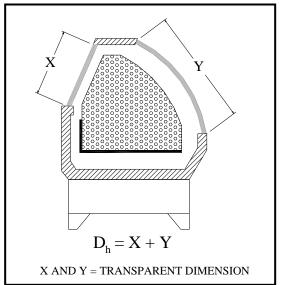
D_h = projected area of visible product

L = Length of Merchandiser

A_e = projected area of product through end walls







Total Display Area is "merchandising focused" allocation of energy.



Examples of DOE Energy Limits

Equipment class ²	Standard level*** (kWh/day)***
VOP.RC.M	0.82 × TDA + 4.07
SVO.RC.M	0.83 × TDA + 3.18
HZO.RC.M	0.35 × TDA + 2.88
VOP.RC.L	2.27 × TDA + 6.85
HZO.RC.L	0.57 × TDA + 6.88
VCT.RC.M	0.22 × TDA + 1.95
VCT.RC.L	0.56 × TDA + 2.61
SOC.RC.M	0.51 × TDA + 0.11
VOP.SC.M	1.74 × TDA + 4.71
SVO.SC.M	1.73 × TDA + 4.59
HZO.SC.M	0.77 × TDA + 5.55
HZO.SC.L	1.92 × TDA + 7.08
VCT.SC.I	0.67 × TDA + 3.29
VCS.SC.I	$0.38 \times V + 0.88$
HCT.SC.I	0.56 × TDA + 0.43
SVO.RC.L	2.27 × TDA + 6.85
VOP.RC.I	2.89 × TDA + 8.7
SVO.RC.I	2.89 × TDA + 8.7
HZO.RC.I	0.72 × TDA + 8.74

Excerpt from 10 CFR Part 431

Manufacturer & Customer can choose **how** the energy limit is met!



What Is the Impact on the Retailer?

- Some Higher Efficiency Options Become Standard
 - ECM motors in all products
 - LED lighting and high efficiency doors/frames (door cases VCT)
 - Manufacturers will consult with customers on options that must change
- Frequently Asked Questions
 - Is equipment already in stores affected? NO
 - Can I still move my equipment among stores? YES
 - Can I still refurbish and reinstall equipment? YES
 - How do I know that the equipment I receive meets DOE regs?
 - Manufacturer will apply certification label to product.
 - What is required to prepare for this change?

Nothing. The onus is on your supplier! Store environments are critical as always!