Solstice™ family of HFOs

AC Leading Technology in all Ambients

May 2013

Honeywell

Agenda

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- Honeywell: history of innovation
- Introduction to HFOs and Solstice™ family
- MAC (Mobile Air Conditioning)
- Commercial Refrigeration. Genetron® Performax™ LT
- Stationary air conditioning: A/C, chillers, heat pumps
- Conclusions
- Questions & a.o.b.

$39-39.5B
in sales*

54%
sales outside U.S.

- 1,300 sites, 70 countries
- 132,000 employees
- Morristown, NJ headquarters
- Fortune 100

Aerospace

Performance Materials and Technologies

Automation and Control Solutions

Transportation Systems

*2013 guidance

Energy Efficiency & Clean Energy Generation

Honeywell

With more than 50% of our products linked to energy efficiency, Honeywell is helping the world meet its energy challenges

By immediately and comprehensively adopting existing Honeywell products, the U.S. could **reduce energy consumption 20 to 25%**

Honeywell's Businesses

Honeywell

Aerospace

Phoenix, AZ headquarters

$12.1-12.3 billion sales*

Automation and Control Solutions

Minneapolis, MN headquarters

$16.4-16.6 billion sales*

Performance Materials and Technologies

Morristown, NJ headquarters

$6.9-7.0 billion sales*

Transportation Systems

Rolle, Switzerland headquarters

$3.6-3.7 billion sales*

*2013 guidance

Performance Materials and Technologies

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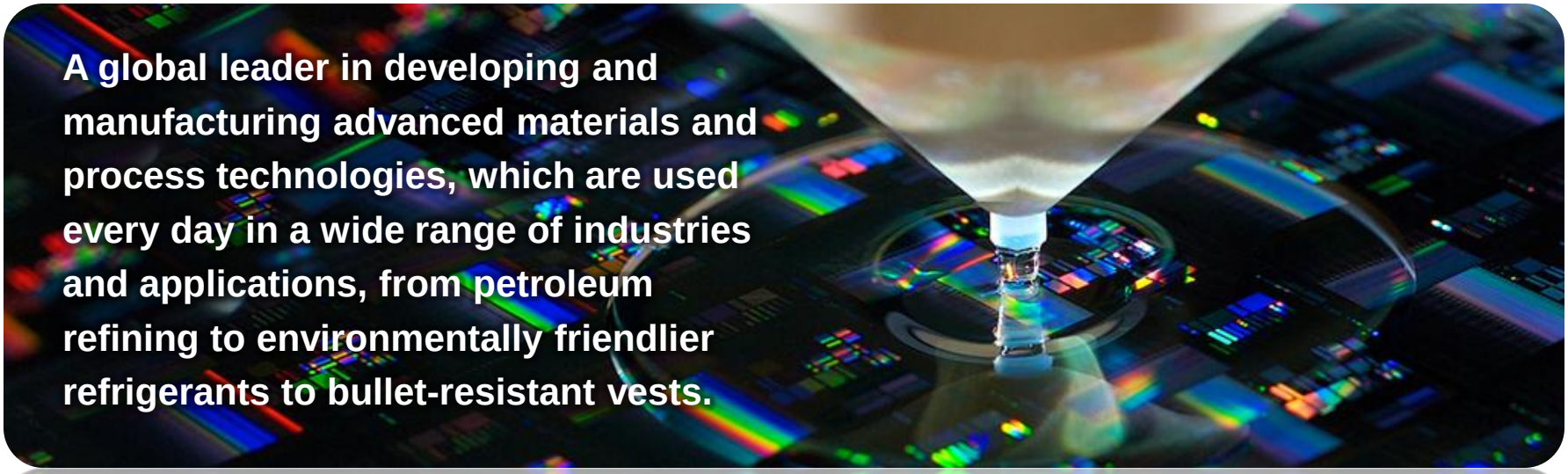

Businesses:

- Honeywell's UOP
- Fluorine Products
- Resins and Chemicals
- Specialty Products
- Electronic Materials

$6.9-7.0 billion sales*

Products:

- Process technology, equipment, catalysts, adsorbents, and services for the refining, petrochemical, and natural gas industries
- Fluorine technology, including non-ozone-depleting and low-global-warming-potential refrigerants and blowing agents
- Specialty films, additives, and chemicals
- Advanced fibers and composites for armor and industrial applications
- Intermediate products, including nylon feedstock caprolactam, nylon resin, ammonium sulfate fertilizers, and chemical intermediates.
- Electronic materials and chemicals

*2013 guidance

Honeywell's refrigerants key attributes

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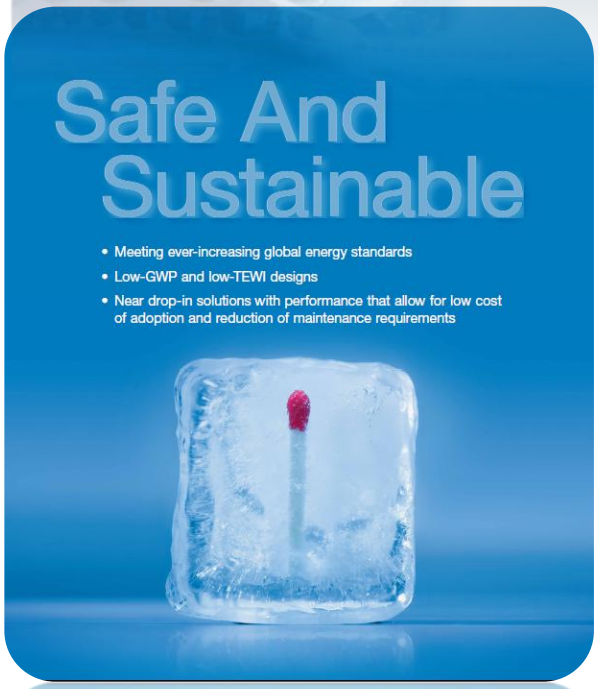

Fluorine Products – A history of innovation

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Energy efficiency + Environmental compliance + Safety + Cost-affordable

Montreal Protocol

Kyoto Protocol

F-gas

CFCs | HCFCs | HFCs | HFOs

1900s | 1990s | mid 1990s | 2006

Very high ODP & GWP

High ODP and GWP

ODP=0, but high GWP

ODP=0
GWP low or ultra low

R12

R123
R22

404A
410A
407C
134a
407F

Solstice™ family

Solstice™ family of HFOs

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New Solstice™ molecules

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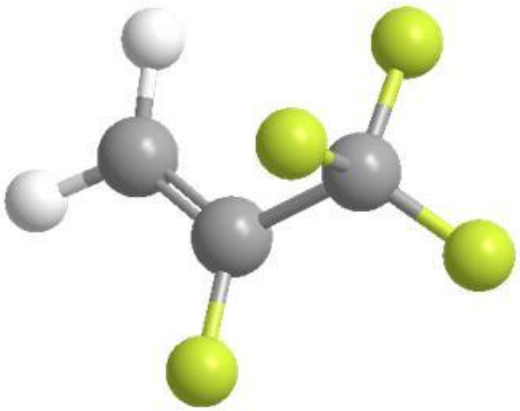
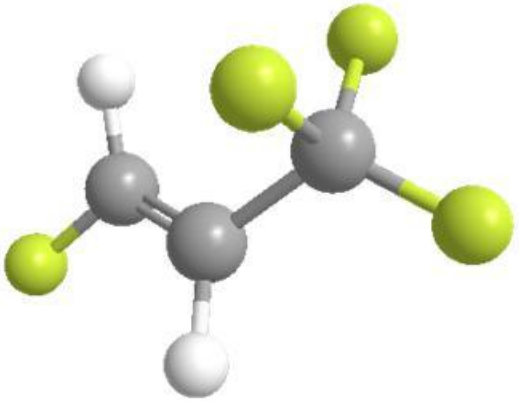
Solstice yf



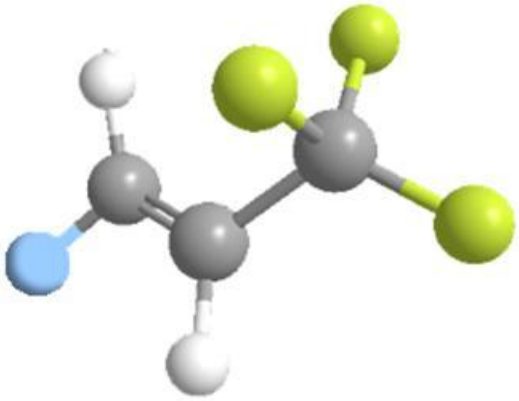
- GWP_{100} = 4
- Mildly flammable
- REACH registered +1,000+mT/y
- Registered for a/c & refrigeration use

Solstice ze



- GWP_{100} = 6
- Mildly flammable
- Registered under REACH for 1,000+ mT/y
- Registered for foam, aerosols and refrigeration

Solstice zd



- GWP_{100} = 5
- Non-flammable
- REACH registered +100+mT/
- Registered for foam, aerosols and refrigeration*

* Sep'13

Developed and Commercialized 3 HFO molecules with low GWP

Solstice: A Growing Family of Molecules and Blends

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Auto Air-conditioning

Aerosols / Solvents

Blowing Agents

Stationary A/C and Refrigeration

Pipeline of 4th Generation Products being commercialized

Honeywell's Solstice™ low GWP refrigerants

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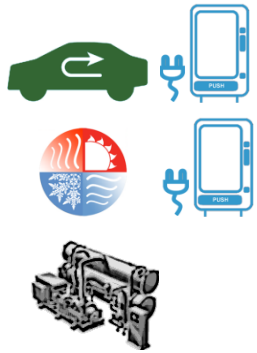
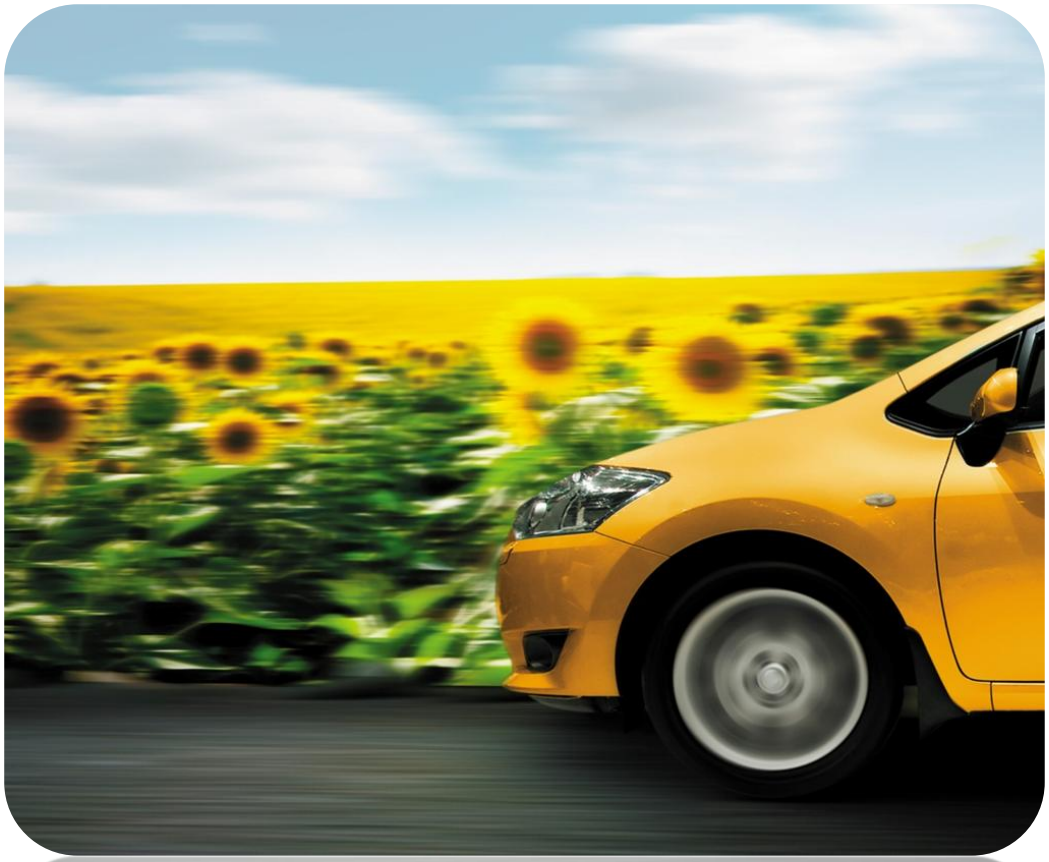
Solstice™ HFO's – low and medium pressure applications			
Current Product	**Non Flammable** (ASHRAE A1)	**Mildly Flammable** (ASHRAE A2L)	**Examples of Potential Applications**
HFC-134a GWP=1430		**Solstice yf** GWP = 4	**Auto A/C, Vending, Refrigerators**
		Solstice ze GWP = 6	**Chillers, CO_2 Cascades Refrigerators**
R-123 GWP= 77	**Solstice zd** GWP <5		**Centrifugal Chillers**



Solstice™ HFO Blends			
Current Product	***Solstice™ N Series*** **Reduced GWP Option Non Flammable (ASHRAE A1)**	***Solstice™ L Series*** **Lowest GWP Option Mildly Flammable (ASHRAE A2L)**	**Examples of Potential Applications**
HFC-134a GWP=1430	**N-13** – GWP ~600		**Chillers, Med-temp Refrigeration**
HCFC-22 GWP=1810	**N-20** - GWP ~1000	**L-20** - GWP <300	**Stationary A/C, Refrigeration**
R-404A GWP=3922	**N-40** - GWP~1300	**L-40** - GWP 200-300	**Low-Temp Refrigeration**
R-410A GWP=2088		**L-41** - GWP <600	**Stationary A/C Applications**



Automobile air-conditioning

HFO-1234yf: lowest carbon footprint in Automobile

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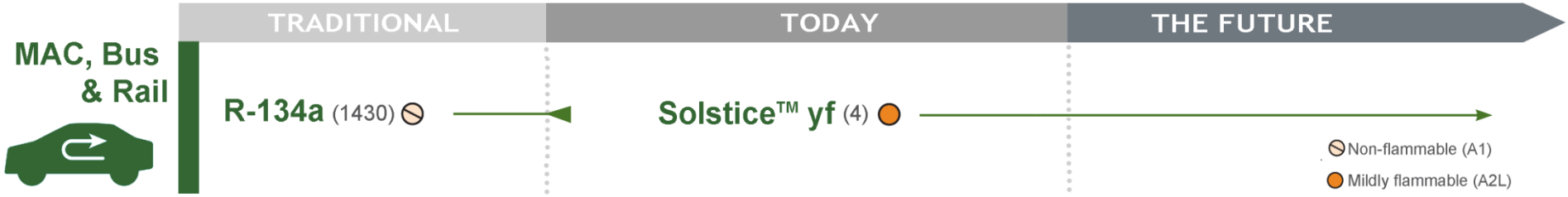
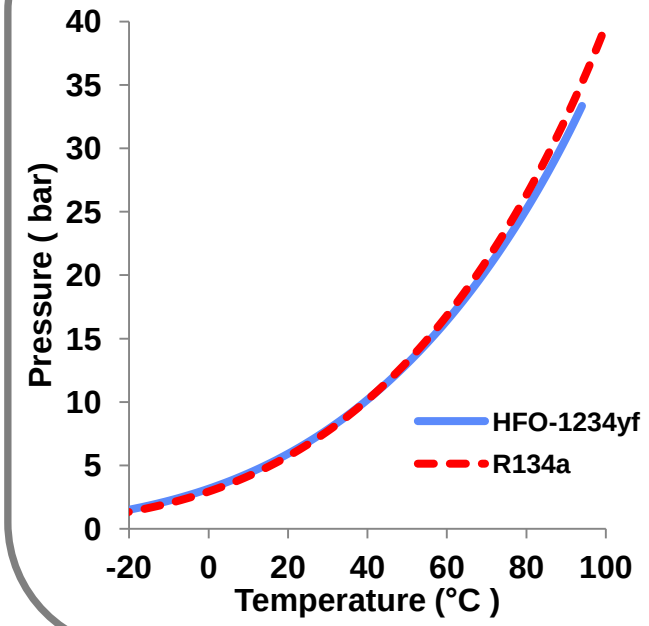
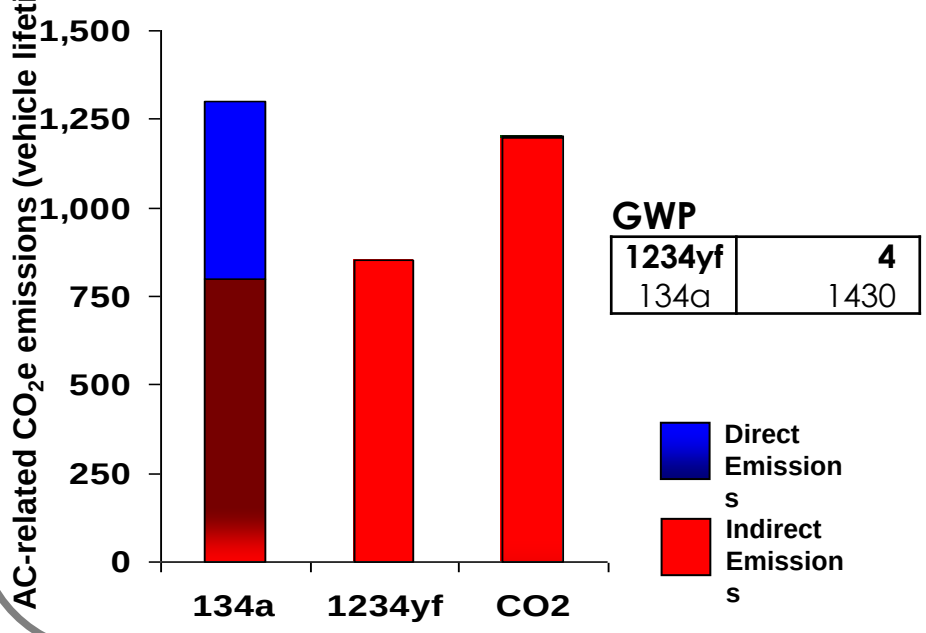


Similar performance



Lowest carbon footprint



HFO-1234yf : lowest carbon footprint of all AC technologies

Commercial Refrigeration

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Commercial Refrigeration and R407F

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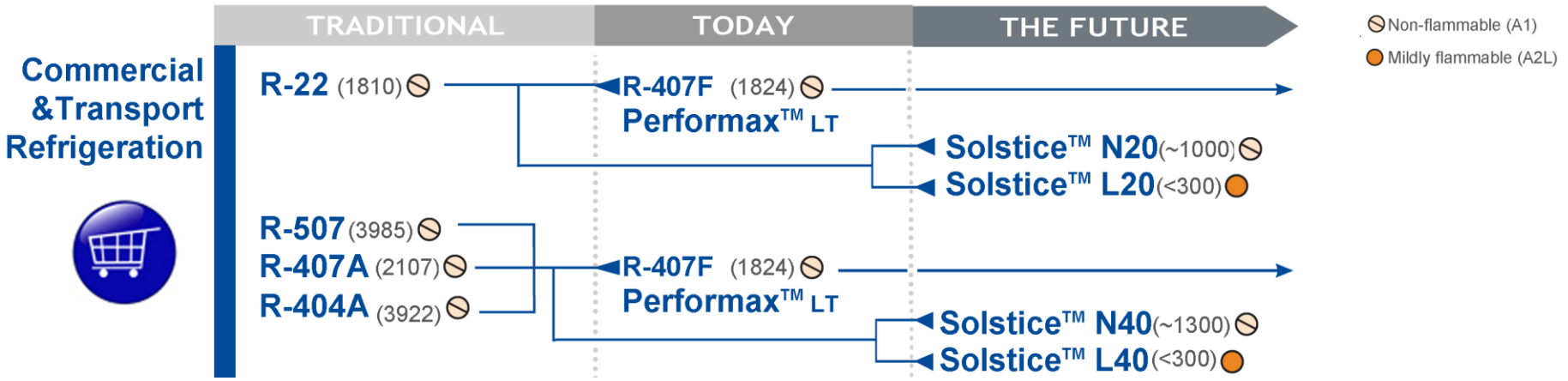

Performax™ LT: the best solution

- Mimics R22 performance
- Composed of commonly used HFC components
- Meets refrigeration specifications
- Limited modification at installation
- No change of major components
- Known system technology
- Safety standards as R22/R404A
- Service standards as R22/R404A
- Same skills for technicians
- Same installation
- More than 600 installations and no issues

Lower GWP*

Reduction of direct CO_2 emissions: 52%

Lower energy consumption

Reduction of TEWI* up to 40%

Operations costs reduction up to 10%

*** GWP: Global Warming Potential**
TEWI: Total Equivalent Warming Impact

Best solution to improve efficiency and reduce carbon footprint & running cost

Reduced/Low GWP Options for Commercial Refr.

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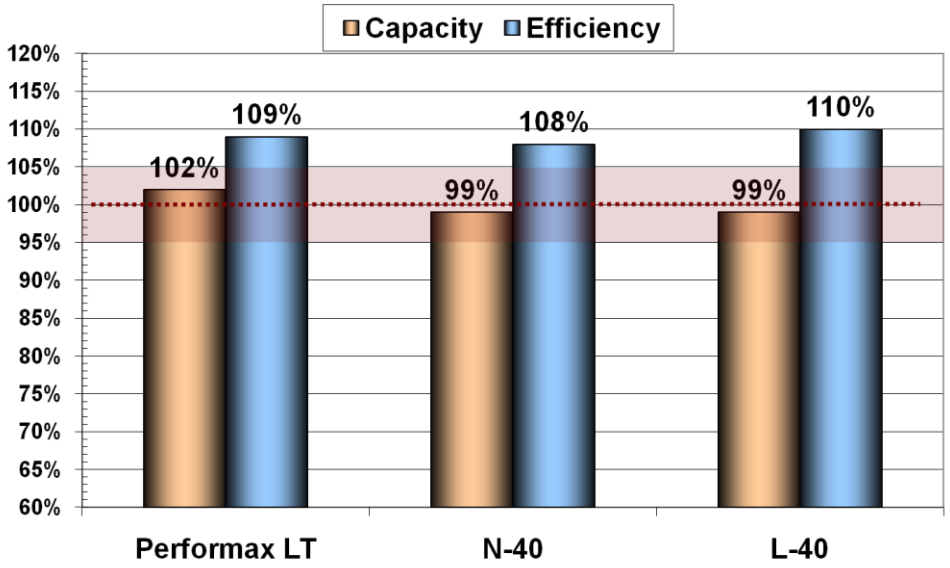

Reduced GWP Options:

- Currently available refrigerant - Performax LT (**R-407F)**
  - GWP reduction of over 50% relative to R-404A. GWP ~15% lower than R-407A.
  - Performance is superior to both R-404A and R-407A.
- We have a developmental refrigerant, N-40
  - N-40 can be used in existing R-404A equipment with little or no modifications
  - GWP reduction of over 65% as compared to R-404A with higher efficiency.

Low GWP Options:

- L-40 is the lowest GWP option that has capacity consistent with R-404A
  - GWP reduction of over 90% relative to R-404A with superior efficiency.

Solstice™ N40: first freezer counter

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- Improved energy consumption
- Lower recovery time after defrost
- Better pull-down time
- 65% reduction in direct emissions

precision refrigeration

Solstice product	Type	Alternative to	GWP	Ashrae class	Performance (vs alternative)	Applications	Status
N40	HFO blend	R404A	~1300	A1	Better efficiency than R404A	LT refrigeration	Available for testing
L40			<300	A2L			

	Pulldown time (min)	Recovery time after defrost (min)	Max Tdis (°C)	kWh usage over 24 hours
R404A	78	29	85	11.44
Solstice L40	92	36	84	11.32
Solstice N40	65	24	75	10.70

Better performance than 404A while reducing carbon footprint

Refrigeration systems comparison

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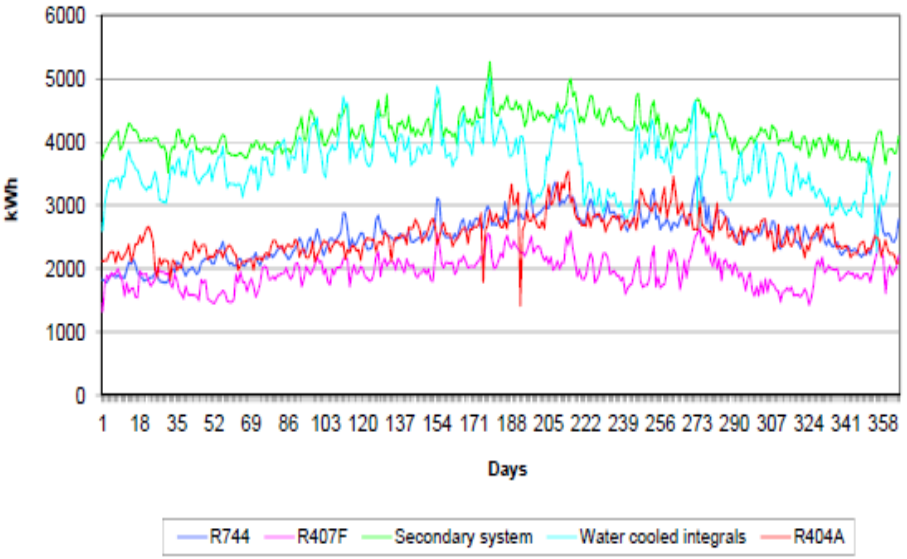
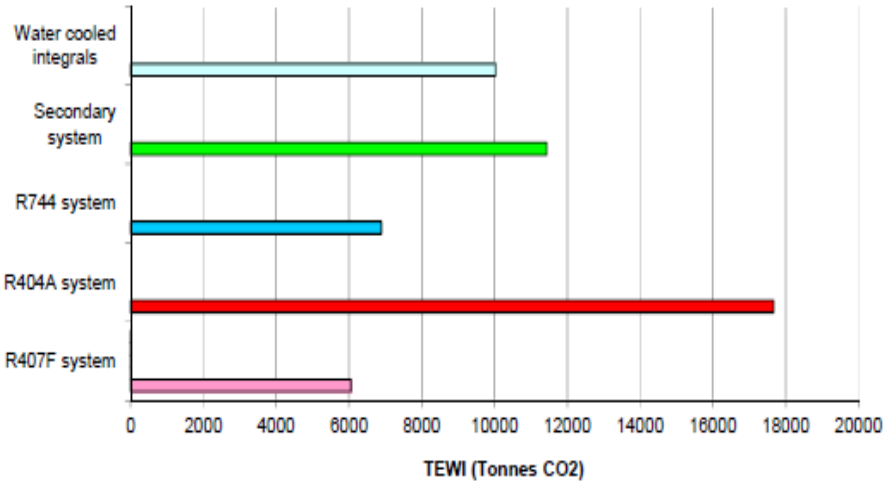
ASDA 2011 Energy Consumption Monitoring*





- **Real Life monitoring of ASDA model store, with loads within 5%.**
- **R407F shows lowest energy consumption and lower *environment impact***

*** Evaluation of available refrigeration Systems in the retail Sector, B. Churchyard & J.Bailey, IOR 2012**

Energy consumption simulated, Pack Calc II

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Original data from Pack Calc II (Independant Software Calculation)

Comparison to R407F using field trial data

City	Transcritical CO2 simple booster [kWh]	HFC 404A [%]	HFC indirect systems [%]	Cascade (R134/CO2) [%]	HFC 407F Calculated Worst Case [%]	HFC 407F Calculated Best Case [%]
Stockholm	200.272	+10	+36	+20	+4	-2
København	203.228	+9	+36	+20	+3	-3
Oslo	201.309	+9	+36	+20	+3	-3
Amsterdam	215.477	+6	+34	+18	0	-6
Berlin	223.761	+4	+30	+15	-2	-8
Paris	233.269	+1	+27	+13	-5	-11
Lyon	245.977	-1	+23	+9	-7	-13
Madrid	271.159	-4	+19	+6	-10	-16
Marseille	279.484	-7	+17	+3	-13	-19
Barcelona	282.695	-8	+16	+3	-14	-20
Rom	289.547	-8	+14	+1	-14	-20

Reference: DTU, Technical University of Denmark (IPU)

ADVANSOR™ by Hill PHOENIX

Reference: Customer & other 3rd Party Retro-fit difference to R404A (Avg Worst & Best)

World energy map

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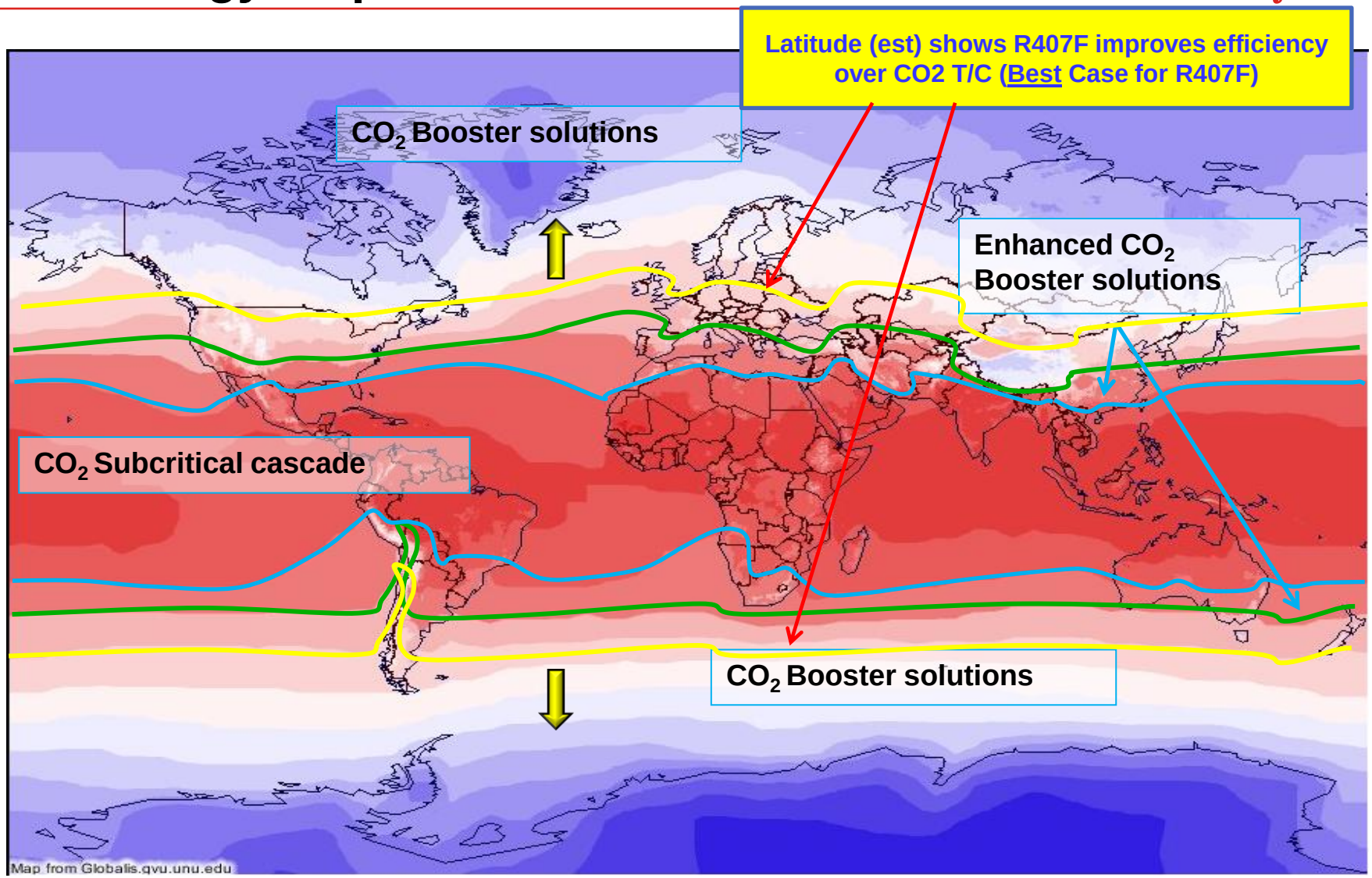

ADVANSOR by Hill PHOENIX

Reference: Advansor CGF June 2013

Stationary air conditioning

Comfort: stationary A/C, chillers and heat pumps

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Where	Residential	Small hotels, schools, office buildings, residential buildings…	Big shopping centers, big hotels, airports, etc…	**District cooling&heating**, big boats, industries
What	Portable room a/c Split Windows Heat pumps	Rooftop, packaged Small chillers Heat pumps	Chillers Heat pumps	Chillers Heat pumps
Refrigerant	**410A/ R32 / Solstice L41** **407C / Solstice L20**	**410A / Solstice L41** **407C / Solstice L20**	**410A / Solstice L41** **134a / Solstice ze**	**134a /Solstice ze** **123 /Solstice zd**

Solstice platform of HFOs and HFO blends cover all the range

Low GWP Refrigerants in Stationary AC Systems

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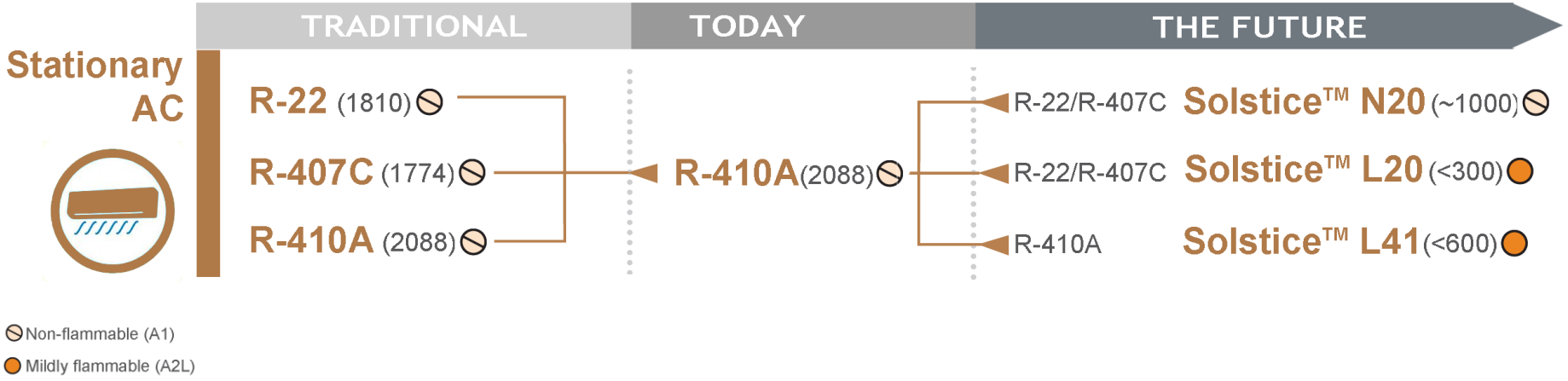

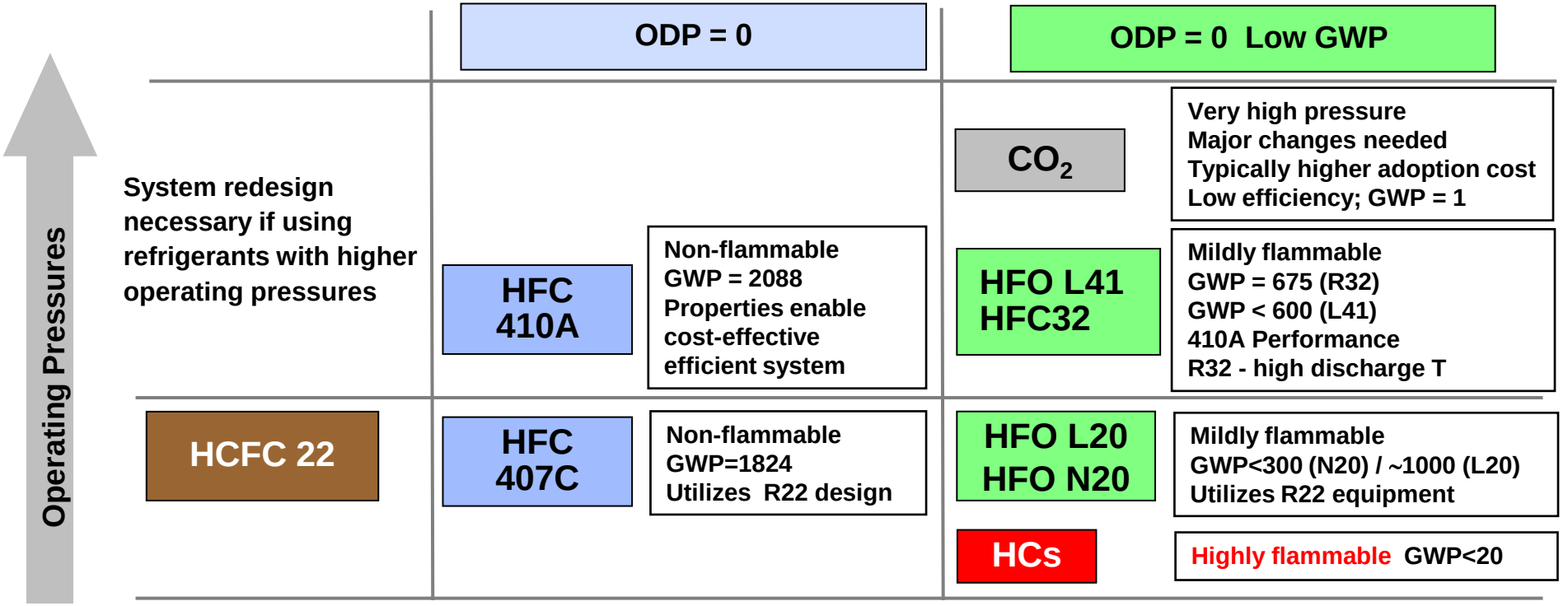

Solstice™ L20 : Utilizing R22/R407C design

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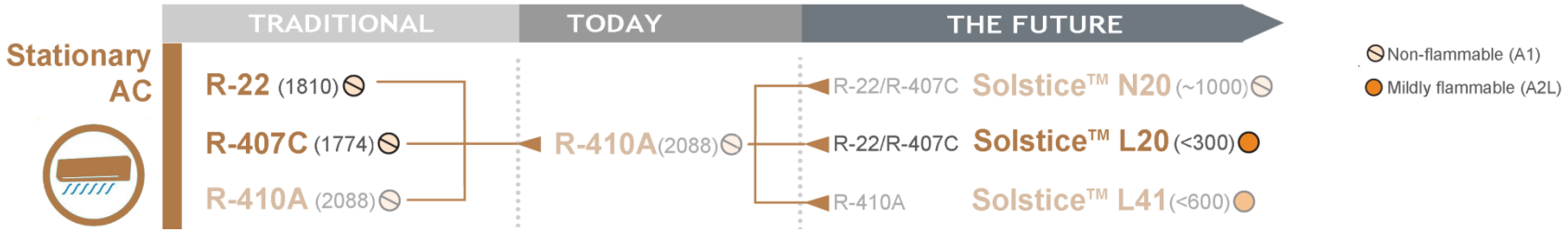
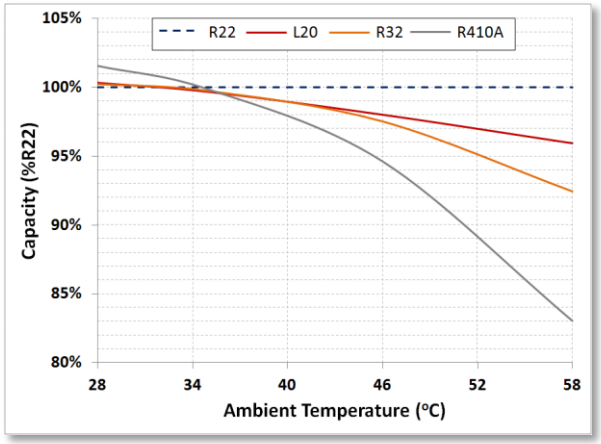
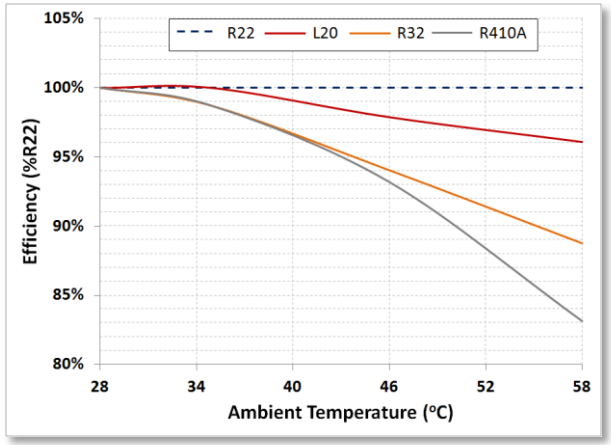


- Solstice L20 systems have same capacity as R22 at 35˚C, and efficiency at 28˚C ambient
- High ambient temperature (46ºC):
  - Solstice L20 shows performance similar to R22 and better than R410A and R32

	Ambient Temperature 46ºC			
	Tdisch (ºC)	Cap.	Eff.	Power
R22	114	100%	100%	100%
Solstice L20	105	**98%**	**98%**	100%
R410A	101	95%	**93%**	101%
R32	124	98%	**94%**	104%





Solstice™ L-20 performs well at high ambient temperatures

Solstice™ L41: Utilizing R410A design

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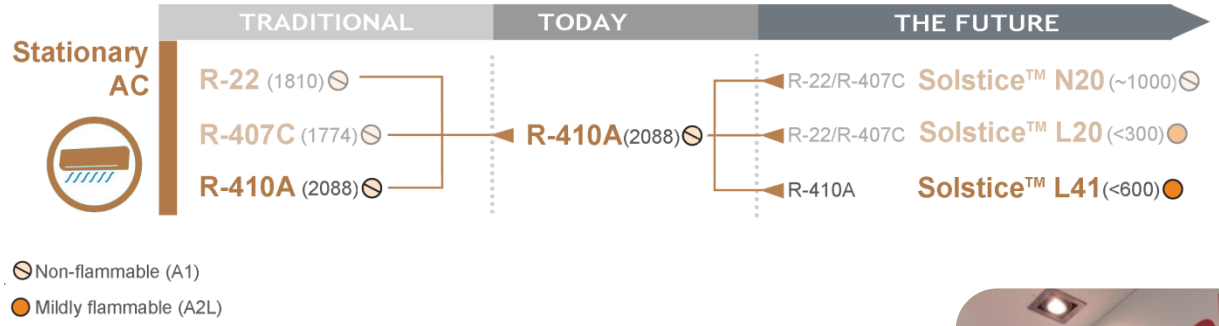

Haier Network Smart Appliance Project

- World's first Solstice L41 A/C
- A cooperative effort between:
  - Honeywell — Shanghai R&D Center
  - Haier — National Laboratory
- Presented in
  - HVAC China — Jul'12
  - Chillventa Europe — Oct'12
  - China Refrigeration Exhibition — Apr'13
- More than 70% reduction in GWP versus R410A
- Lower discharge pressure than R32
- Lower discharge temperature than R32
- Lower power consumption than R410A and R32 at **high ambient temperature**

Solstice™ L41 outperforms other alternatives in high ambient A/C

Solstice™ L41 vs R410a : Mini Split system

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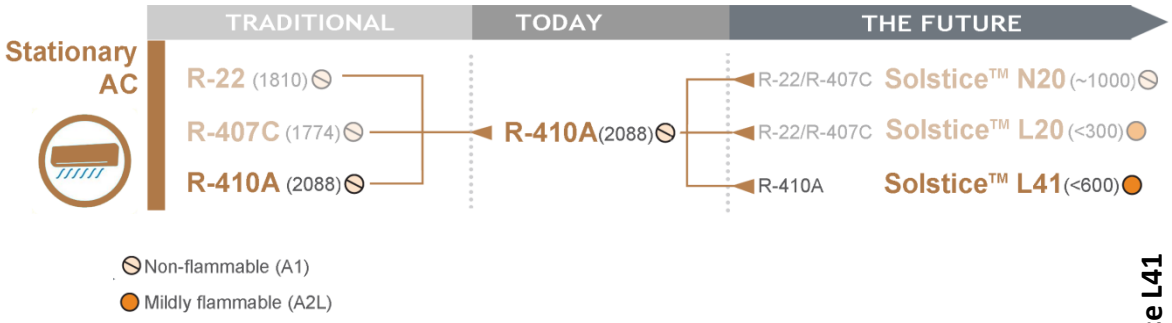
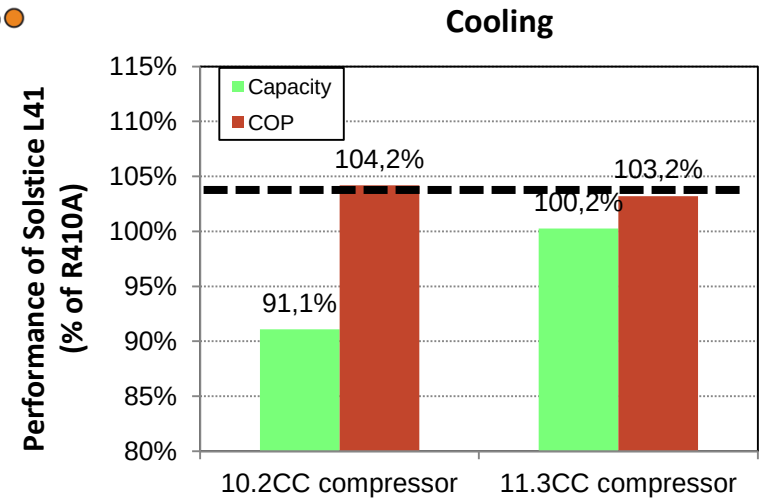
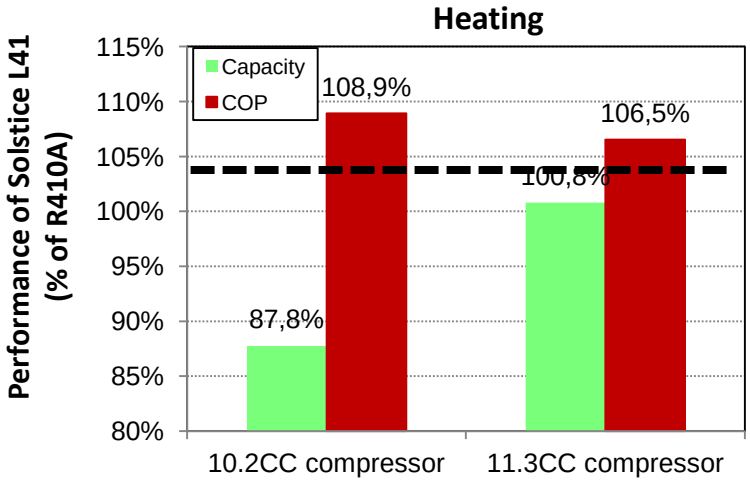


Performance results

- Higher efficiency achieved for both heating and cooling modes relative to R410A
- Lower capacity with nominal compressor; slightly higher displacement compressor required
- Capacity and Efficiency results match R410A performance with higher displacement compressor
- Discharge temperature was slightly higher with L41 (~11ºC) but well below maximum permissible and below temperatures seen with R32





LGWP solutions for R410A based systems developed

Refrigerants operating envelope in high ambient

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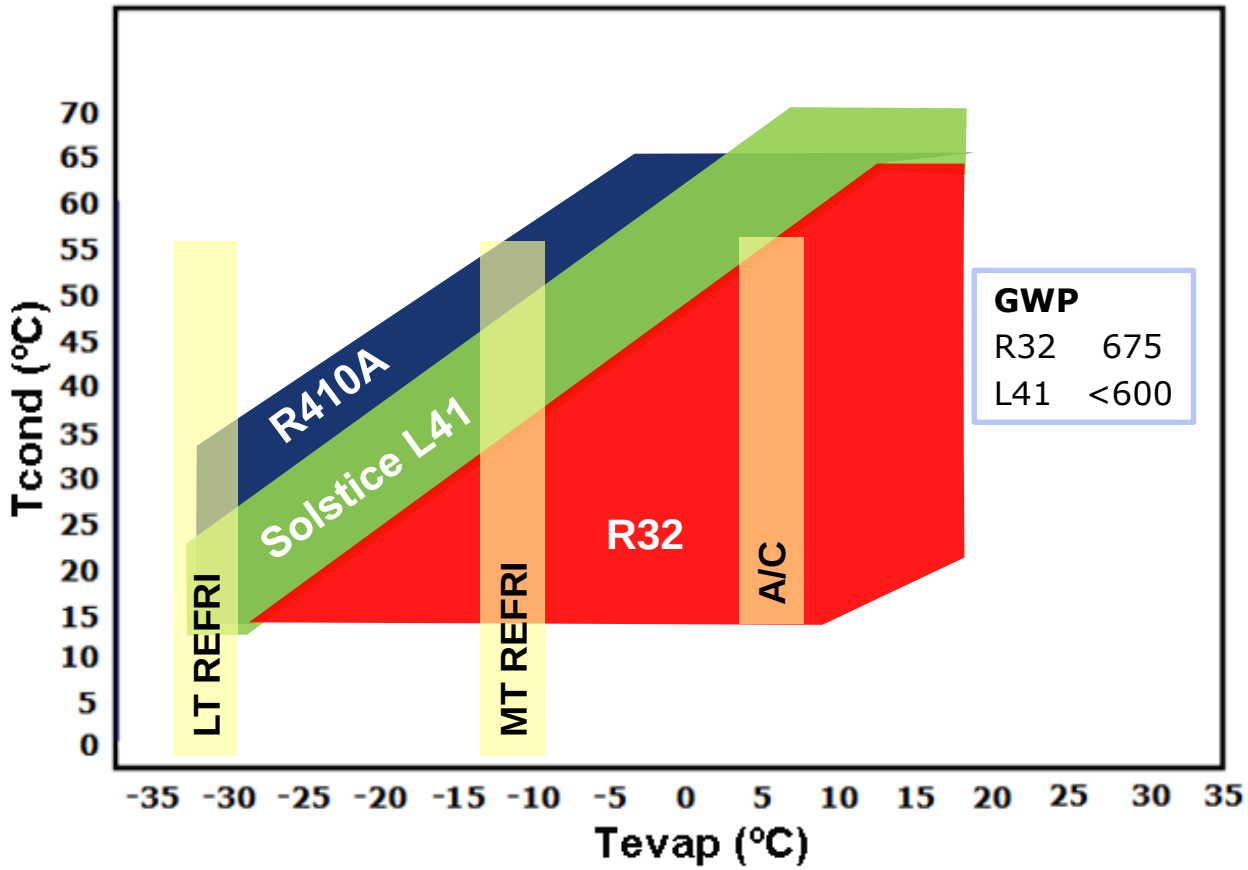

- Solstice L41 OK for extended applications
- Higher condensing temperatures achievable with SolsticeL41 → **high ambient A/C**
- Solstice L41 10% less capacity than 410A; better efficiency; more miscible with POE than R32

Promising Results for Solstice™ L41

Solstice™ L41 vs R32 vs R410a in stationary A/C

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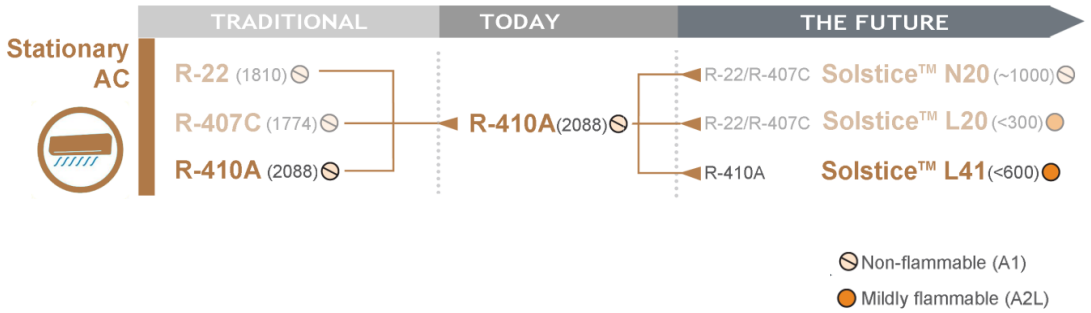
- **R-32 has been proposed as an R-410A replacement**
  - Similar performance to R-410A
  - GWP of 675, a 67% reduction



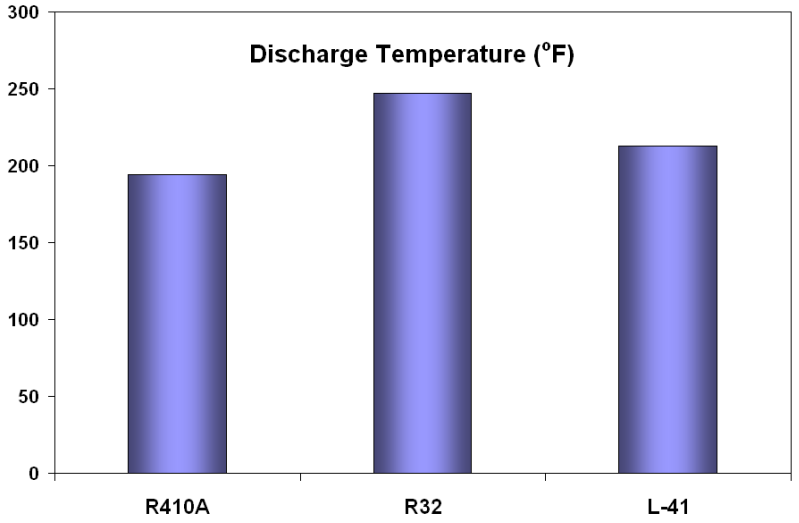
- **Solstice L41 blend outperforms R-32:**

1. GWP

- GWP of 600 for L41 vs. 675 for R-32

2. Discharge Temperature

- L41 has lower discharge temperatures than R32
- Important in very warm climates
- Less cost to mitigate



3. High Ambient Temperature Performance

- R32 power consumption increases at high temps
- Adds to peak electricity demand issues

4. Flammability

- L41 has higher minimum ignition energy and lower flame speed – lower risk
- Much less flammable than propane (R290)
- Lower cost to mitigate

HFO blends offer cost-effective performance

Chillers

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Solstice™ L20: replacing R407C in chillers

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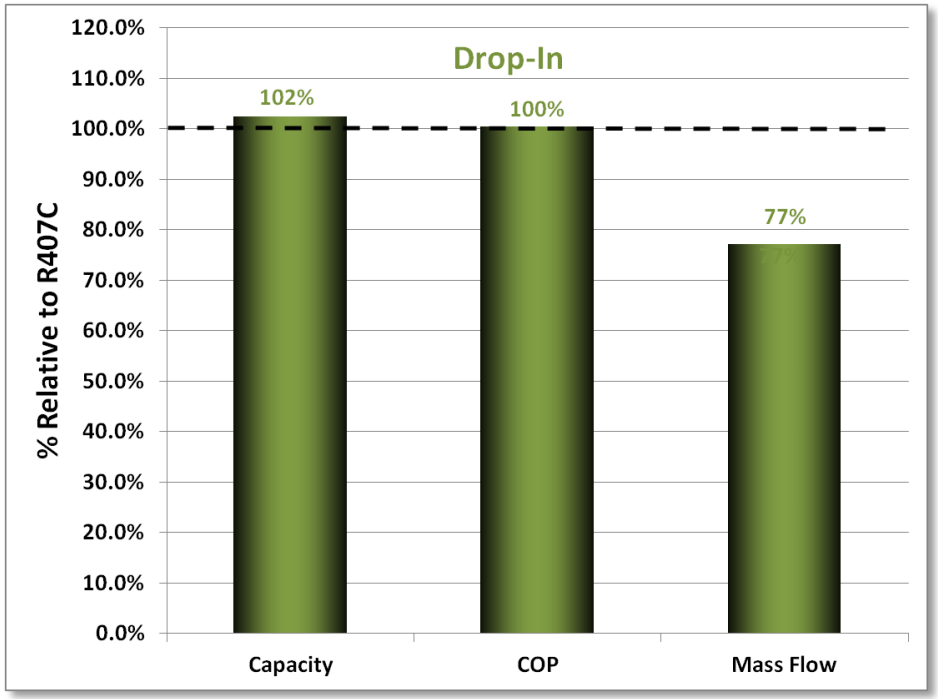
Solstice L20 (R407C Replacement)

- "Drop in" performance shows higher capacity (102%), comparable COP (100%) and lower mass flow (77%)
- Lower flow rate indicates potential for further improvement in the design of heat exchangers



Solstice™ L20 as high ambient replacement for aircooled types

Solstice™ L41: replacing R410A in chillers

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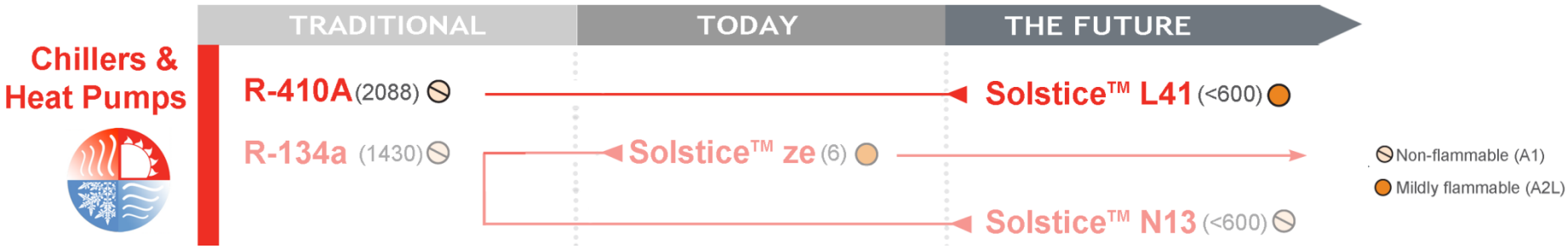
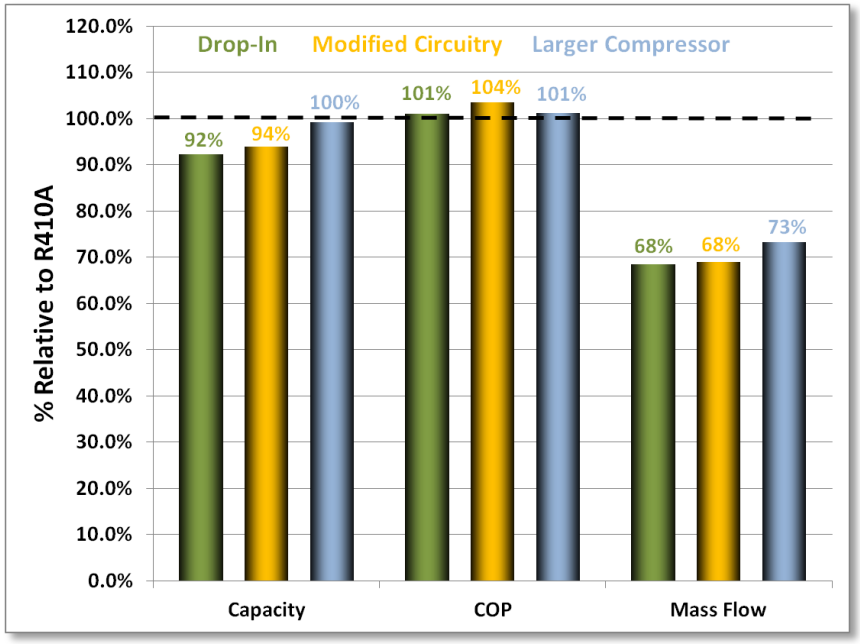


Drop in test

- Slightly lower capacity (92%)
- Comparable COP (101%)
- Lower mass flow (68%)
- Heat exchangers circuitry modified to increase mass velocity
- Capacity matching by increasing compressor displacement by 8%

OEM test (AREP program)

- Capacity of 96% of R-410A
- Efficiency at 103%



Solstice™ L41 as low GWP alternative in air cooled chillers

Solstice ze: replacing R134a in medium pressure chillers

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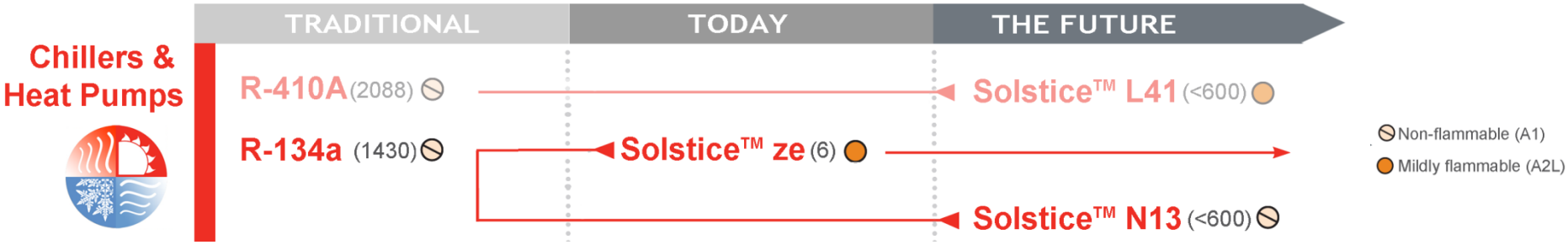

- Solstice™ N13 & Solstice™ ze: similar efficiency to R134a
- Solstice N13: potential use in existing equipment
- Solstice ze good candidate for new equipment
  - Up to +5% CoP in chiller
  - Cooling capacity -25% @ ARI conditions
    - Can be overcome by design
  - Examples available in the market

Solstice ze&N13: potential use in medium pressure chillers

Solstice™ ze chillers

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Solstice™ ze Screw Chiller
(Geoclima)

Solstice™ ze Centrifugal Chiller (Geoclima, Turbocor Compressor)

Solstice™ ze in chillers in exhibition shows

Solstice™ ze replacing R134a in chillers

Honeywell

Various Compressor technologies HFO ready

Danfoss TURBOCOR

To Be Released Mid 2013

- Several Solstice ze chillers already installed
  - Supermarkets
  - Department stores
  - Industrial facilities

KLIMA-THERM

GEOCLIMA PROFESSIONAL AIR CONDITIONING

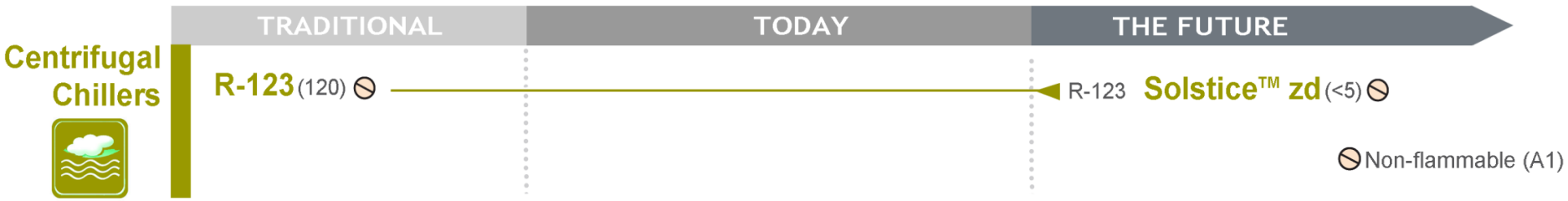
- Several compressor manufacturers already validating Solstice ze
  - Frascold
  - Danfoss Turbocor
- Reduced carbon footprint
- Higher efficiency

STAR REFRIGERATION

Solstice™ ze Shows 7 to 12% Higher COP than R134a

Solstice zd : replacing R123 in low pressure centrifugal chillers

Honeywell



Solstice™ zd

- Replacement of R123
- Similar efficiency to R123
- It can provide higher capacity with minor system modifications
- Due to higher pressure than R123, system modifications may be required

Solstice™ zd can match efficiency of R123 and provide higher capacity

Heat pumps

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Ducted split heat pump: Solstice™ L41

Honeywell

- Tests in a representative ducted split heat pump at all climates
- Compressor: current technology
- Results:
  - Reduced discharge temperatures → better suited for high temperature
  - Increased solubility of current lubricants
  - Capacity was reduced but a slightly larger displacement compressor (~10%) recovered this capacity without negatively impacting efficiency

		Cooling			Heating Rating (+8ºC amb.)		Heating Low Temp (-8ºC amb.)	
	Glide Ev (ºC)	**Capacity** (35ºC amb.)	**Efficiency** (28ºC amb.)	**Tdis (ºC)** (46ºC amb.)	**Cap.**	**Eff.**	**Cap.**	**Eff.**
R410A	0.1	100%	100%	96	100%	100%	100%	100%
R32	0.0	108%	101%	**119**	105%	100%	102%	98%
Solstice L41*	3.8	104%	100%	109	104%	101%	105%	101%

* 11% larger displacement compressor

Promising Results for Solstice™ L41

Large heat pumps: Solstice™ ze

Honeywell

- District cooling/heating heat pumps working with Solstice ze
- Industrial heat pumps for food / cultivation processes with Solstice ze (Tcond=100°C achievable)
- Easy modification from 134a systems to Solstice ze
  - Re-design for increased capacity
  - Better efficiency → lower energy consumption
    → lower carbon footprint
- Case studies in Q3-Q4 2013

Solstice™ ze provides environmental & efficiency improvement

Conclusions

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Solstice platform key for your future

Honeywell

- Stationary AC Systems
  - Solstice L41 good option as R410A replacement.
  - Outperforms other alternatives in high ambient conditions
    - High COP at high condensing temperatures
  - Solstice L20 and N20: potential alternatives to R22/R407C in residential AC
    - Solstice L20 performs well in high ambient

- High Pressure Chillers
  - Solstice L41 good option as R410A replacement
    - Not competing at OEMs level. Minor system modifications may be required
    - Critical temperature higher than 410A&R32 → Better suited for high ambient
    - Lower GWP than 410A&R32 and lower discharge temperature than R32
  - Solstice L20 is a potential alternative to R407C

- Medium pressure centrifugal chillers – Replacing R134a
  - Solstice™ ze for new equipment: high efficiency, available on the market
  - Solstice N13 promising option for replacing R134a in existing equipment

- Low pressure centrifugal chillers
  - Solstice™ zd as replacement of R123: higher capacity, similar efficiency

- Heat Pumps / District Heating
  - Solstice L41 and Solstice™ ze for high condensing temperatures and high efficiency.

Solstice platform is key for the future of your business

A technology leader in refrigerants solutions

Honeywell

- Expertise & technology leadership along the years enables progress in your business
- High ambient A/C requires refrigerants with unique characteristics.
- A new generation of refrigerants invented by Honeywell can over perform other alternatives in high ambient conditions and preserve the four key attributes:

Performance **Sustainability** **Safe Compliant** **Cost-effective**

- Local teams and regional focus keep us up-to-date on your needs

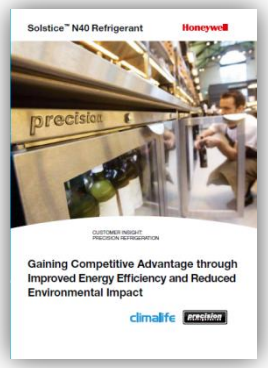
Supporting our partners worldwide with global capabilities &expertise

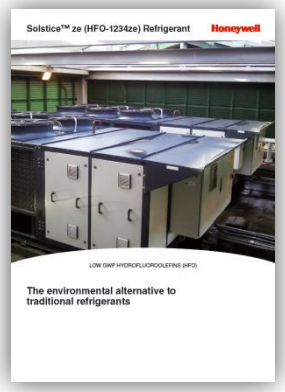
Partners all around the world

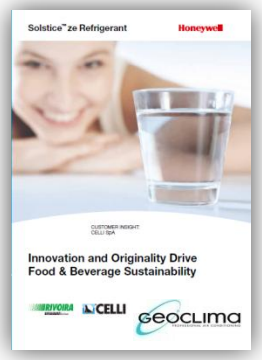
Honeywell

- Technology leadership enables our partners to
  - Achieve real progress
  - Create positive impact in their business and in their world

- Trialling Honeywell's Genetron® and Solstice™
  - Thermodynamic analysis
    - Genetron Properties Suites → most advanced simulator in the market (free)
    - Three R&D laboratories (US, India, Shanghai)
    - Experts' support
  - Samples
  - Analysis of results
  - Publications, media exposure, congresses…







We look forward to collaborating with you in trials / research programs

Thank you! Questions?

Honeywell

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www.honeywell.com

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AHRI AREP Project - Competitive Activity

Honeywell

- **AHRI initiated a program to evaluate the performance of LGWP refrigerants for multiple stationary applications.**
- **Candidate refrigerants were submitted as well as participant test plans for this evaluation. Testing is now expected to be completed by Q2 of 2013.**
- **Since the candidates were submitted a year and a half ago, changes are likely to compositions.**
- **AHRI also conducting risk assessment for heat pump using 2L refrig.**

Baseline Refrigerants	Alternative Refrigerant Candidates Classifications according to ASHRAE Standard 34			Others[2]
	A1	A2L	A3	
R-134a	AC5X, ARM-41a, D4Y, N-13a, N-13b, Opteon™XP10	AC5, R-1234yf, R-1234ze(E), ARM-42a	R-290+R-600a (40%+60%), R-600a	
R-404A	ARM-32a, N-40a, N-40b, DR-33	ARM-31a, ARM-30a, D2Y-65, L-40, R-32, R-32+R-134a (50%+50%), DR-7	R-290	R-744
R-410A		R-32, ARM-70a, D2Y-60, DR-5, HPR1A L-41a, L-41b, R-32+R-134a (95%+5%), R-32+R-152a (95%+5%)		R-744
R-22/R-407C	ARM-32a, LTR4X, N-20	D52Y, L-20, LTR6A	R-290	R-1270, R-717

AHRI AREP – R-134a Alternatives

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R-134a Alternatives

					ASHRAE	Thermo Performance*	
Refrigerant Supplier	Designation	Composition	(Mass%)	GWP	Class	Capacity	Efficiency
Arkema	ARM-41a	R-32/R-134a/R-1234yf	(6/63/31)	943	A1	15%	-2%
Arkema	ARM-42a	R-134a/R-152a/R-1234yf	(7/11/82)	117	A2L	1%	0%
Daikin	D4Y	R-134a/R-1234yf	(40/60)	574	A1	-1%	-5%
DuPont	XP-10	R-134a/R-1234yf	(44/56)	631	A1	1%	-4%
Honeywell	N-13a	R-134a/R-1234yf/R-1234ze(E)	(42/18/40)	604	A1	-8%	-2%
Honeywell	N-13b	R-134a/R-1234ze(E)	(42/58)	604	A1	-13%	-1%
Honeywell/Arkema/Daikin	R-1234yf	R-1234yf	(100)	4	A2L	-7%	-6%
Honeywell	R-1234ze(E)	R-1234ze(E)	(100)	6	A2L	-26%	-1%
Mexichem	AC5	R-32/R-152a/R-1234ze(E)	(12/5/83)	92	A2L	4%	0%
Mexichem	AC5X	R-32/R-134a/R-1234ze(E)	(7/40/53)	622	A1	0%	-1%
National	R-290/R-600a	R-290/R-600a	(40/60)	4	A3	-16%	2%
National	R-600a	R-600a	(100)	4	A3	-46%	3%

* Relative to R-134a -7C ET / 43C CT

AHRI AREP – R-22 / R-407C Alternatives

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R-22 / R-407C Alternatives

Refrigerant Supplier	Designation	Composition	(Mass%)	GWP	ASHRAE Class	Thermo Performance* Capacity	Efficiency
Daikin	D52Y	R-32/R-125/R-1234yf	(15/25/60)	979	A2L	*-5%*	*-1%*
Honeywell	L-20	R-32/R-152a/R-1234ze(E)	(45/20/35)	331	A2L	4%	-1%
Honeywell	N-20	R-32/R-125/R-134a/R-1234yf/R-1234ze(E)	(12.5/12.5/31.5/13.5/30)	975	A1	-17%	0%
Mexichem	LTR4X	R-32/R-125/R-134a/R-1234ze(E)	(28/25/16/31)	1295	A1	8%	-2%
Mexichem	LTR6A	R-32/R-744/R-1234ze(E)	(30/7/63)	206	A2L	16%	-2%
-	R-1270	R-1270	(100)	4	A3	3%	-1%
National	R-290	R-290	(100)	4	A3	-14%	0%
-	R-717	R-717	(100)	0	B2L	10%	1%

* Relative to R-22 4C ET / 38C CT

Except for D52Y - Rel to 407C

AHRI AREP – R-404A Alternatives

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R-404A Alternatives

Refrigerant Supplier	Designation	Composition	(Mass%)	GWP	ASHRAE Class	Thermo Performance* Capacity	Efficiency
Arkema	ARM-30a	R-32/R-1234yf	(29/71)	199	A2L	2%	8%
Arkema	ARM-31a	R-32/R-134a/R-1234yf	(28/21/51)	491	A2L	1%	11%
Arkema	ARM-32a	R-32/R-125/R-134a/R-1234yf	(25/30/25/20)	1577	A1	8%	8%
Daikin	D2Y-65	R-32/R-1234yf	(35/65)	239	A2L	11%	9%
DuPont	DR-7	R-32/R-1234yf	(36/64)	246	A2L	13%	7%
DuPont	DR-33	R-32/R-125/R-134a/R-1234yf	(24/25/26/25)	1410	A1	6%	8%
Honeywell	L-40	R-32/R-152a/R-1234yf/R-1234ze(E)	(40/10/20/30)	285	A2L	5%	12%
Honeywell	N-40a	R-32/R-125/R-134a/R-1234yf/R-1234ze(E)	(25/25/21/9/20)	1346	A1	1%	9%
Honeywell	N-40b	R-32/R-125/R-134a/R-1234yf	(25/25/20/30)	1331	A1	6%	8%
National	R-32/R-134a	R-32/R-134a	(50/50)	1053	A2L	19%	12%

* Relative to R-404A -7C ET / 43C CT

AHRI AREP – R-410A Alternatives

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R-410A Alternatives

Refrigerant Supplier	Designation	Composition	(Mass%)	GWP	ASHRAE Class	Thermo Performance* Capacity	Efficiency
Arkema	ARM-70a	R-32/R-134a/R-1234yf	(50/10/40)	482	A2L	-15%	3%
Daikin	D2Y-60	R-32/R-1234yf	(40/60)	272	A2L	-20%	2%
DuPont	DR-5	R-32/R-1234yf	(72.5/27.5)	490	A2L	0%	1%
Honeywell	L-41a	R-32/R-1234yf/R-1234ze(E)	(73/15/12)	494	A2L	-6%	2%
Honeywell	L-41b	R-32/R-1234ze(E)	(73/27)	494	A2L	-9%	2%
Mexichem	HPR1D	R-32/R-744/R-1234ze(E)	(60/6/34)	407	A2L	-1%	0%
Daikin/National	R-32	R-32	(100)	675	A2L	8%	1%
National	R-32/R-134a	R-32/R-134a	(95/5)	713	A2L	5%	1%
National	R-32/R-152a	R-32/R-152a	(95/5)	647	A2L	3%	1%

* Relative to R-410A 4C ET / 38C CT