



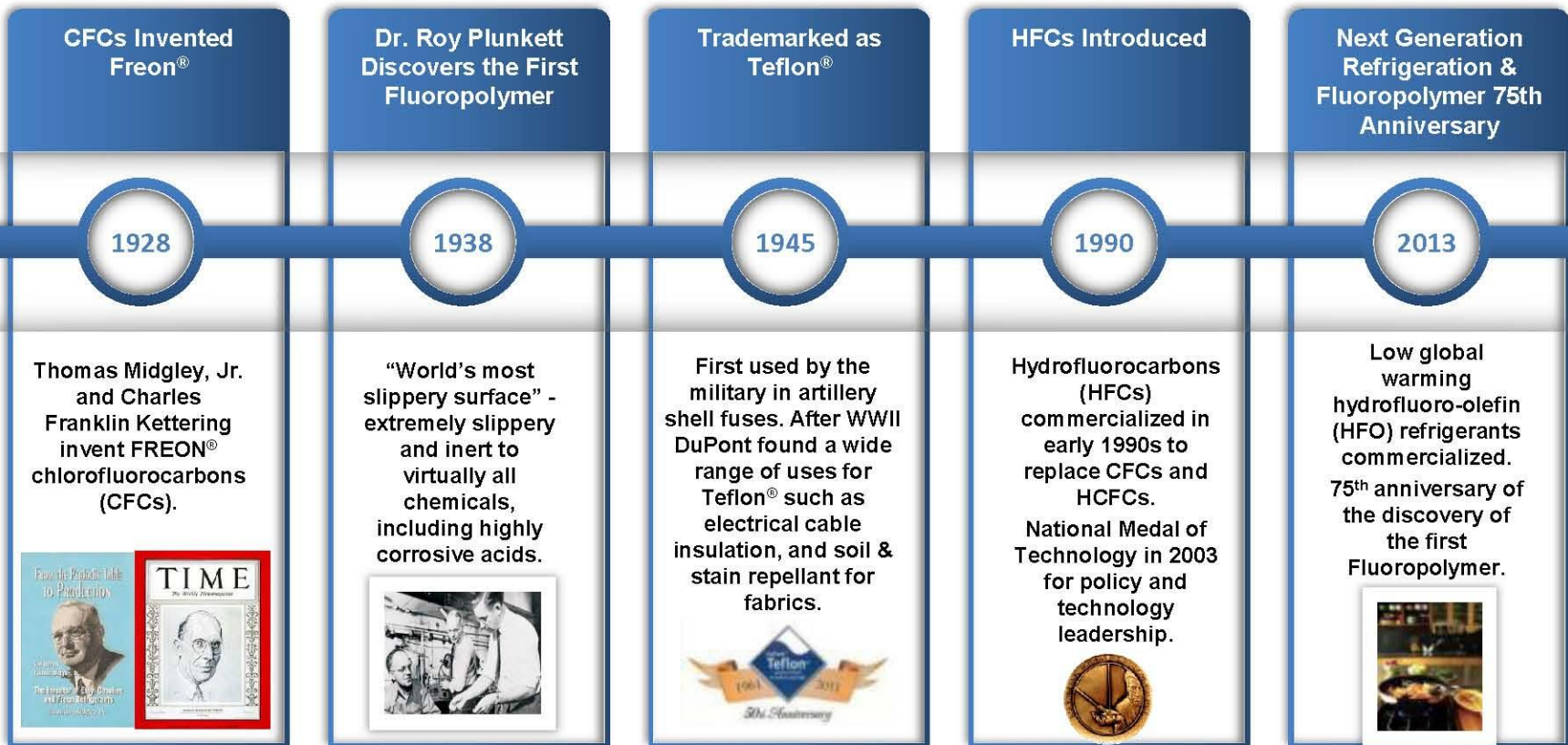
## R-404A Replacement Refrigerants

DuPont™ SUVA® 407A

Properties and Applications



# 85 years of innovation and development in fluorine science



# DuPont Refrigerants Vision

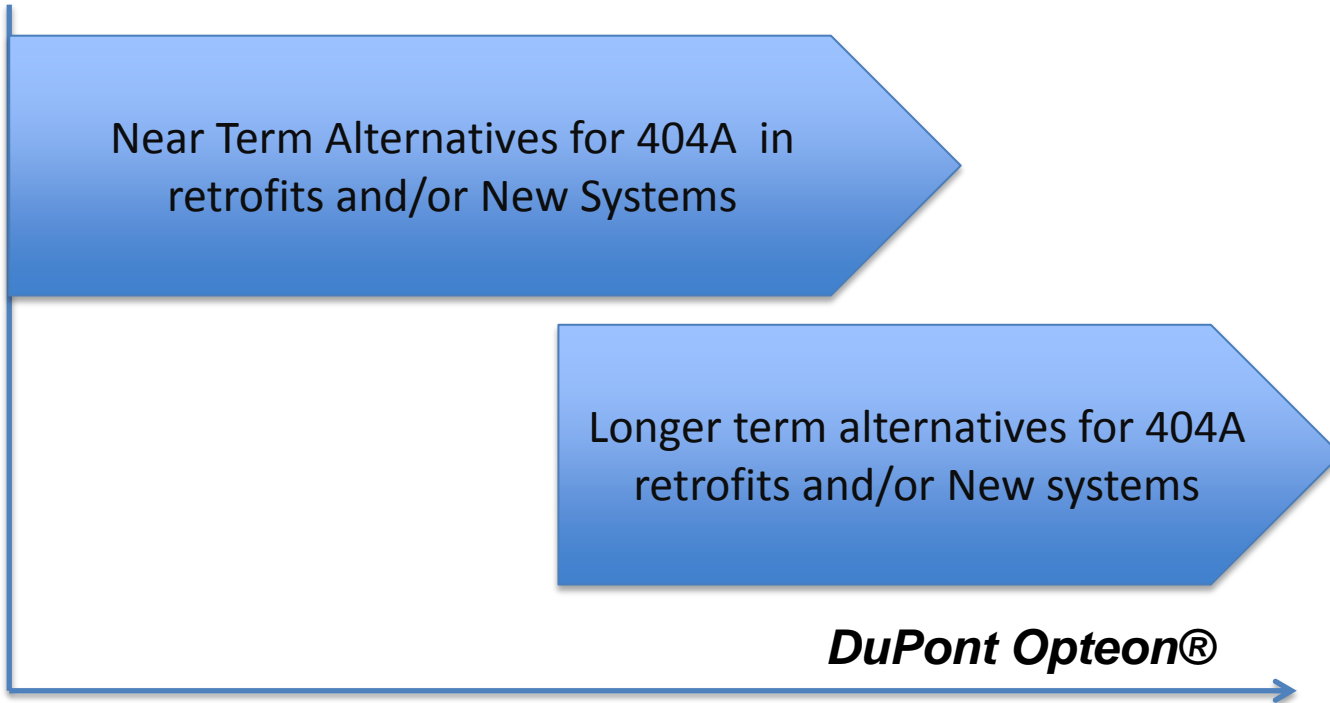
**We will use our science and technology, market knowledge and global reach to provide sustainable materials and solutions to enhance personal comfort, enable preservation of perishable items and improve industrial processing while reducing environmental footprints.**

**We are a leader in environmental business advocacy and sustainable innovation (ISCEON® and Next Gen HFOs)**



# HFC Alternatives for LT/MT Refrigeration Systems

*Suva® 407A*



Near Term Alternatives for 404A in retrofits and/or New Systems

Longer term alternatives for 404A retrofits and/or New systems

*DuPont Opteon®*

2012

2020

# Near Term Alternatives for 404A New Refrigeration Systems

**DuPont™ Suva® 407A**

# Suva® 407A – The Basics

<b>HFC Blend:</b>	<b>R32/R125/R134a (20/40/40wt%)</b>
<b>Applications:</b>	<b>Low and Medium Temp Refrigeration</b>
<b>Lubricant:</b>	<b>Polyol Ester (POE)</b>
<b>Boiling Point:</b>	<b>-45C</b>
<b>Ozone Depletion Potential</b>	<b>0</b>
<b>Global Warming Potential</b>	<b>2110</b>
<b>ASHRAE Safety Classification</b>	<b>A1</b>
<b>Temperature Glide</b>	<b>~4C</b>



# R-407A – Where Does it Make Sense ?

**New Systems:** A good choice when designing and installing new low/med temp refrigeration systems desiring a lower GWP option than R404A/R507

**Existing Systems:** If replacing R404A/R507, engineering evaluation/changes will most likely be required to manage reduced capacity, mass flow, and PT differences.

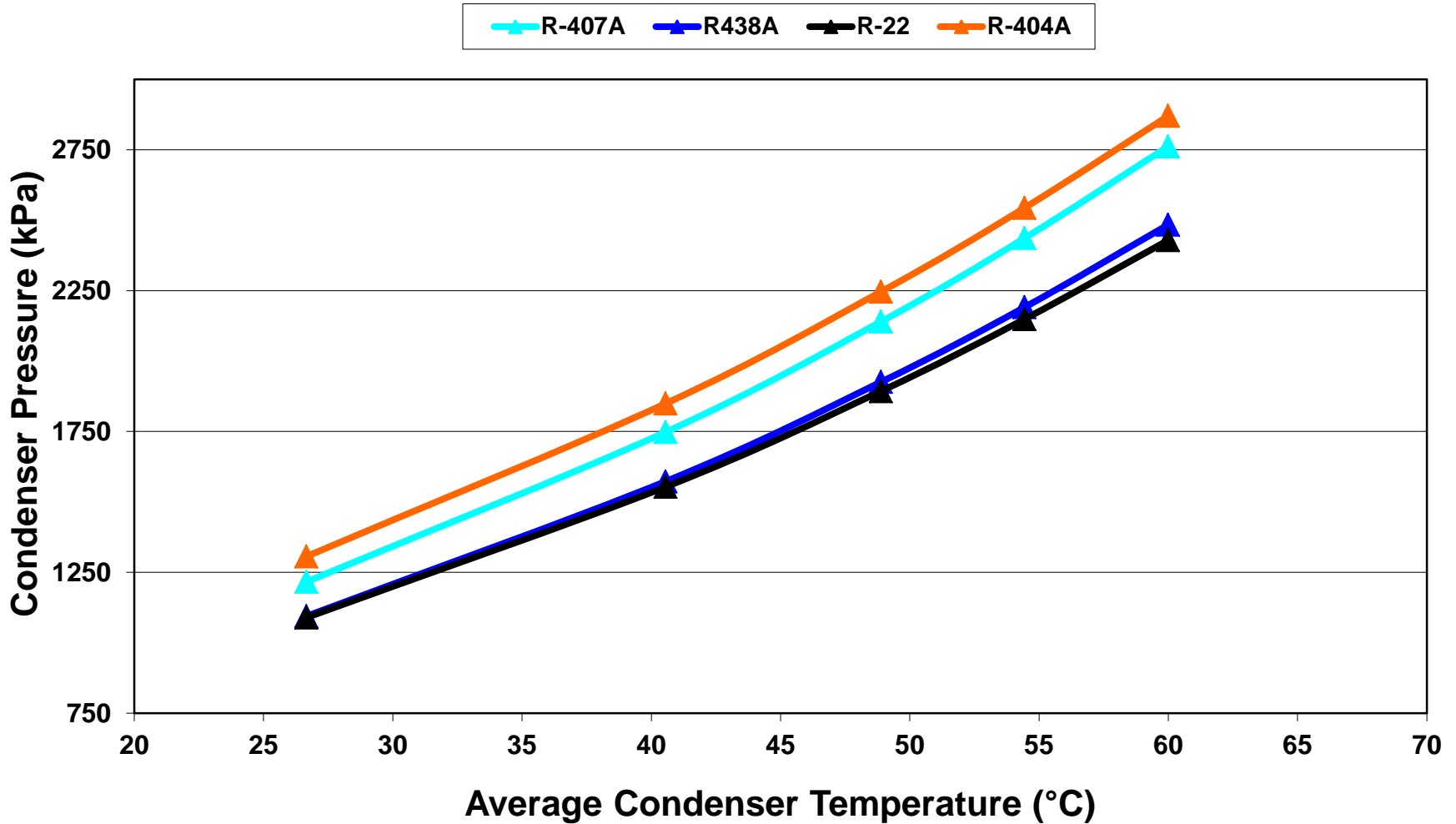
**See DuPont Retrofit Guide.** 

May replace R-22 but will require complete change-out of lubricant to POE.



## Condenser Pressure vs Condenser Temperature

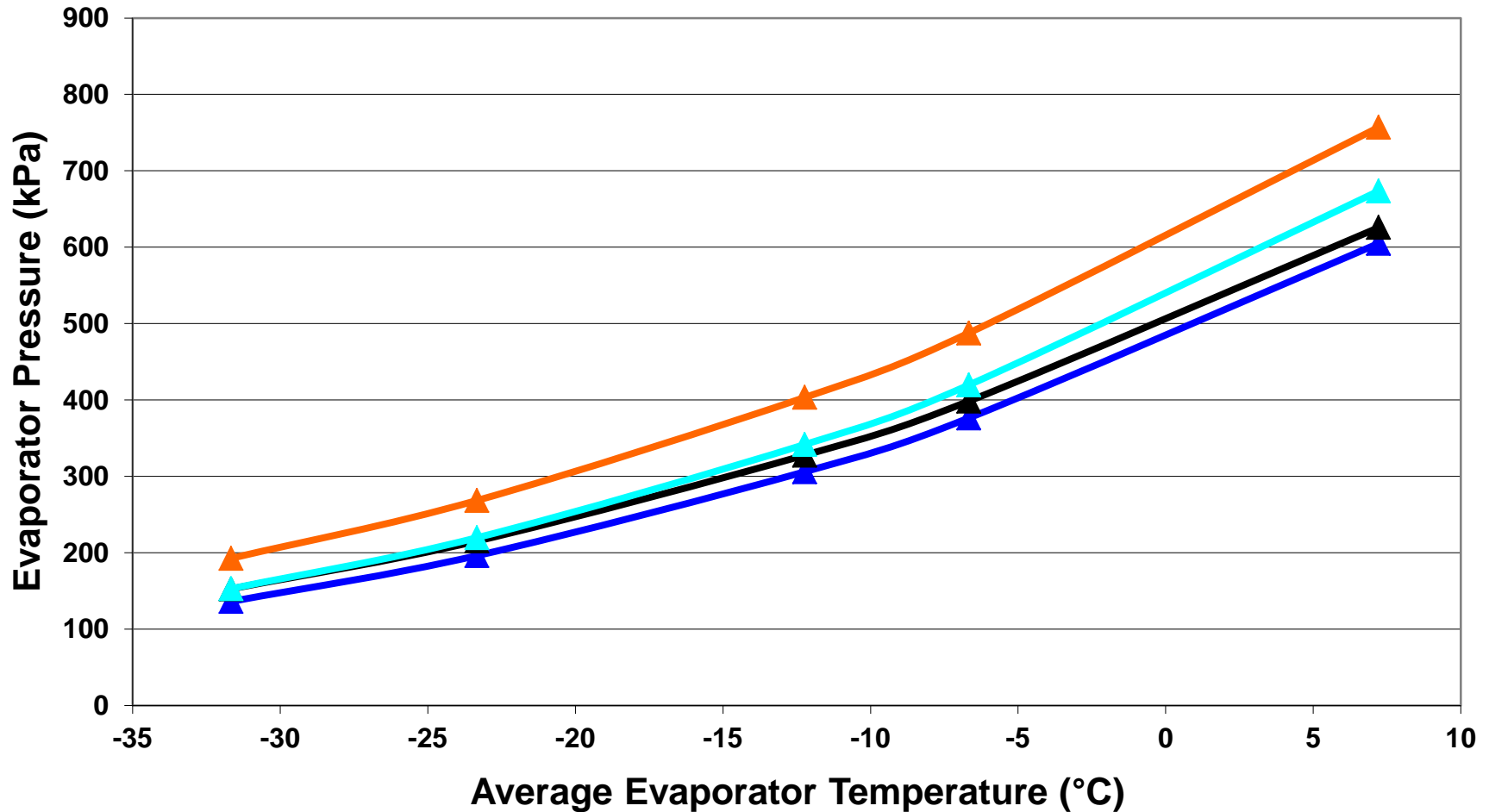
(based on -6.7°C Evaporator, 5.5K subcooling from avg cond T)





## Evaporator Pressure vs Evaporator Temperature

(based on 40.5°C Avg Condenser, subcool liquid to 35°C)



# DuPont Suva® 407A – Benefits

- **GWP reduction (46% vs. R-404A), Zero Ozone Depletion Potential**
- **Wide availability, multiple sourcing options**
- **Years of Proven Performance**
- **Specified by leading retailers for new stores**
- **Uses traditional POE lubricants (same as R404A)**
- **Comparable performance to R404A / R507 in new equipment**
- **Similar energy performance to R404A and R407F**
- **Can be combined with CO<sub>2</sub> in cascading systems to achieve lower carbon footprint**
- **Compatible with common materials of construction/components.**

# Laboratory Calorimeter Data – New Systems

## Relative Performance R407A vs R407F

	<u>Refrg</u>	<u>GWP</u>	<u>Eff</u>	<u>Cap</u>	<u>Disch T</u>	<u>Mass Flow</u>
LT	R407A	2107	1.0	1.0	----	-----
	R407F	1825	0%	+3%	+2F	same
MT	R407A	2107	1.0	1.0	---	----
	R407F	1825	0%	+6%	+6F	same

**Good Performance Match Possible in  
New Systems**

# Laboratory Calorimeter Data Relative Performance R407A & R407F R404A Retrofit Conditions

	<u>Refrg</u>	<u>GWP</u>	<u>Eff</u>	<u>Cap</u>	<u>Disch T</u>	<u>Mass Flow</u>
LT	R407A	-46%	-5%	-12%	+27F	-30%
	R407F	-53%	-5%	-14%	+28F	-30%
MT	R407A	-46%	-2%	-8%	+22F	-30%
	R407F	-53%	-2%	0%	+28F	-30%

**Engineering Evaluation for Retrofits**

# Summary- Alternatives for 404A

**Opteon® Low GWP HFO's in development (2-5 yrs)**

**Specify R407A instead of R404A for new systems**

- **~50% reduction in GWP**
- **Equivalent Performance Achievable**
- **Industry Choice, Proven Technology**
- **Widely Available**

**Retrofit of Existing R404A systems**

- **Engineering Assessment Required**
- **Consult DuPont Retrofit Guide**
- **R-407A performance similar to R407F**

*Thank you!*



*The miracles of science™*