

Developing Countries HCFC phase out / HFC phase down

HCFC Phase out

2015 – 15% reduction

2020 – 35%

2025 - 65%

2030 – 97.5%

2040 – 100%

HFC Phase down

2024 – Freeze

2029 – 10% reduction

2035 – 30%

2040 – 50%

2045 – 80%

Categories of Next Generation Refrigerants

Low Pressure



30+ year design life
Most Efficient

Medium Pressure



15-20 year design life
Medium Efficiency

High Pressure



10-15 year design life
Least Efficient

Choices & Comparison

Screw & Centrifugal Technology Options

	Low Pressure			Medium Pressure			
	R-123	R-1233zd	R-514A	R-134a	R-513A	R-1234yf	R-1234ze
Flammability	Non (1)	Non (1)	Non (1)	Non (1)	Non (1)	Slight (2L)	Slight (2L)
Toxicity	Higher (B)	Lower (A)	Higher (B)	Lower (A)	Lower (A)	Lower (A)	Lower (A)
Fluid Efficiency	9.4 COP	9.3 COP	9.4 COP	8.5 COP	8.3 COP	8.2 COP	8.5 COP
Capacity Change	1	35% Gain	Same	1	Same	5% Loss	25% Loss
GWP	79	1	<2	1300	573	1	1



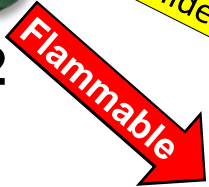
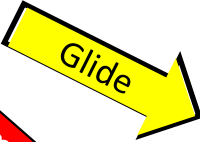
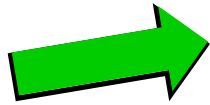
Numerous options available globally

High Pressure Replacements

HCFC → HFC → Low GWP



R-22



R-410A

Blend
50% R-125
50% R-32



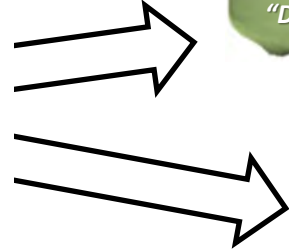
R-407C

Blend
52% R-134a
25% R-125
23% R-32



R-32

Low GWP



R-452B
"DR-55"

Blend
26% R-1234yf
7% R-125
67% R-32



R-32

	High Pressure			
	R-22	R-410A	R-452B	R-32
Flammability	Non (1)	Non (1)	(2L)	(2L)
Toxicity	Lower (A)	Lower (A)	Lower (A)	Lower (A)
Capacity Change		1	6% Gain	4% Loss
GWP	1810	1924	675	677
ODP	0.05	0	0	0
In Current Trane Product Offering				