HVAC/R -> Middle TN Team Meeting -> Dec. 2024

Refrigerants update and more

Annual (or bi-annual) team meeting

- Target historical shoulder seasons and discuss state of current affairs
  - Changes in the industry
    - Rules and regulations
    - Manufacturers and product related
  - Changes within Evolution
    - New processes or procedures internal to our company
    - New processes or procedures as they relate to our customers
- Community/team
  - Get to know each other better and appreciate the work we do
  - Welcome in new members to the team

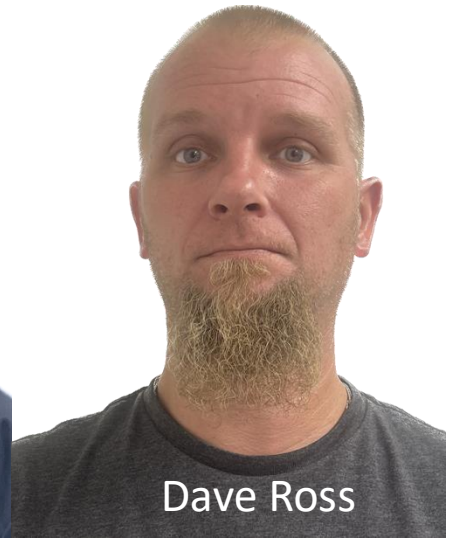
Meet the Team





















What is A2L?

- A = non-toxic, 2 = flammable, L = low burning velocity
- A2L refrigerants are being phased in to replace higher impact GWP (global warming potential) HFC refrigerants like 410A.
- Distinct characteristics of A2L cylinders:
  - Light gray in color with red band at top
  - Have pressure relief valve instead of a rupture disk
  - Use left-handed threading (must use specific A2L connectors)





Refrigerant Background and History

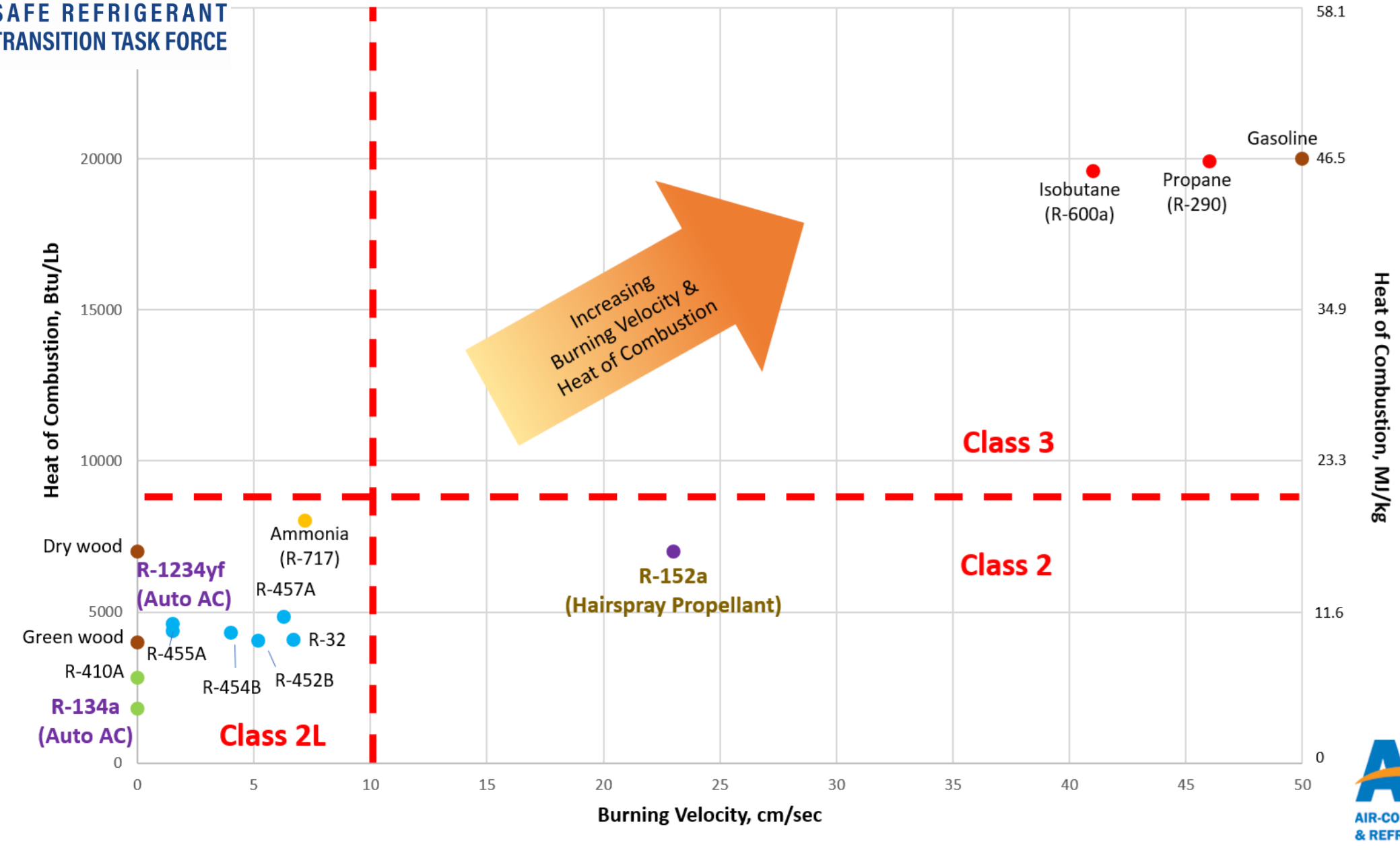
- Refrigerant changes – timeline (through 7:10)
- GWP – Global warming potential
  - Moving forward, regulations will aim toward 500 or lower GWP; 454B meets this criteria
  - GWP has an inverse relationship with flammability -> as we lower GWP, flammability goes up
- Mandate is targeting 85% reduction by 2036
  - Manufacturing of 410A systems banned – January 1, 2025
  - Previously manufactured units can be installed through January 1, 2026
  - R22 and 410A will be available for many years for currently operable HVAC/R

Hazards of A2L Refrigerants??

- https://www.youtube.com/playlist?list=PLSxd3idSC2RZGfART6HZEIa_Zy3vJr39K
- https://www.youtube.com/watch?v=KUFEwg7ADug (1:10 and 4:30)
- https://www.youtube.com/watch?v=UrQP24rTIsU (until 2:45)

SAFE REFRIGERANT TRANSITION TASK FORCE

Flammability Properties

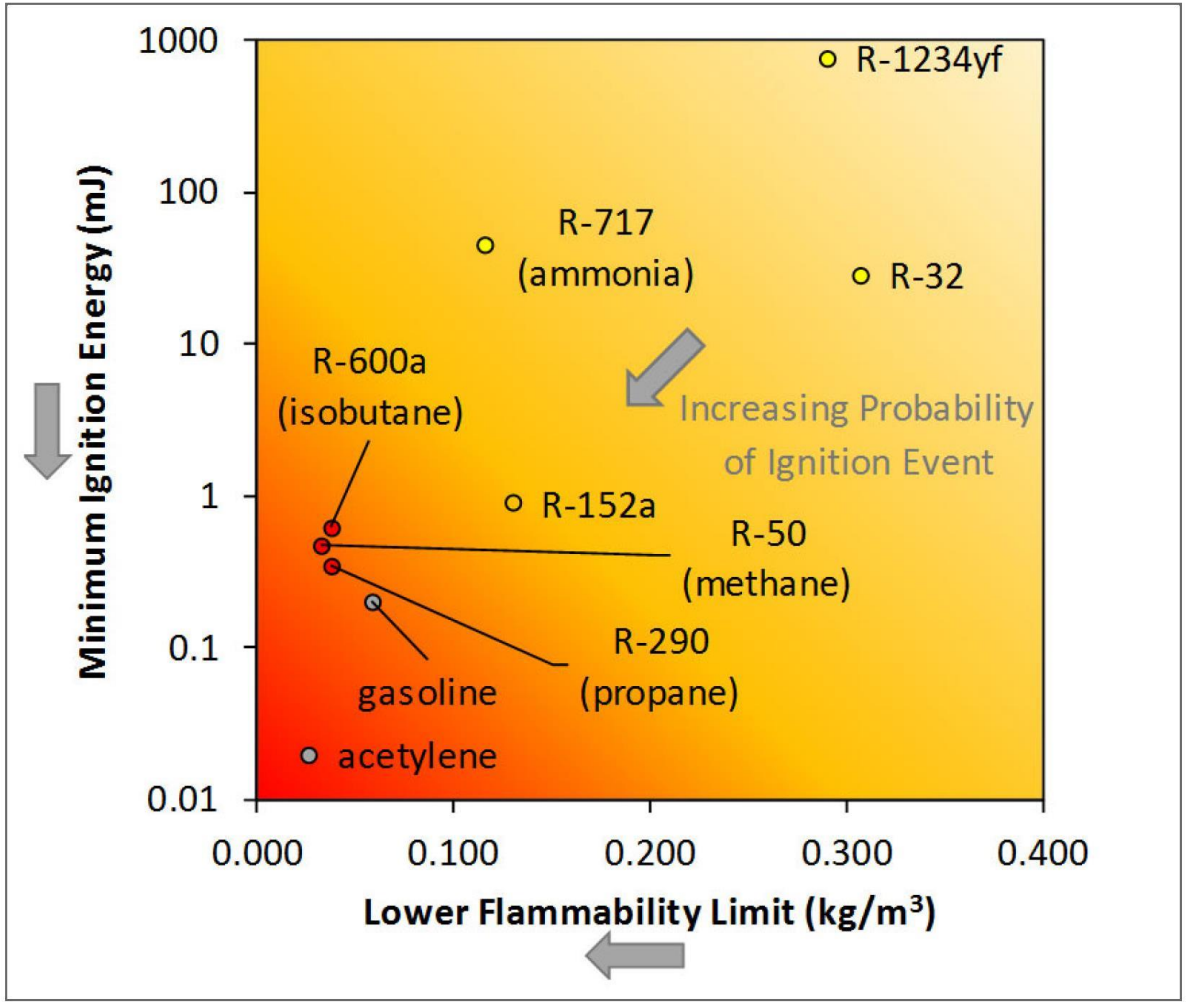


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Flammability – Minimum Ignition Energy (MIE)

- Hydrocarbons require relatively low energy levels to ignite
- MIEs of A2Ls are much higher than hydrocarbons
- Many potential ignition sources for hydrocarbons (e.g., static spark) will not ignite A2Ls
- Many common household items (toasters, electric heaters, etc.) will not ignite A2Ls



System Adjustments for A2L

- Mitigation is achieved through a combination of OEM system design changes
  - ignition source protection
  - refrigerant detectors installed in the product
  - charge size, enhanced system tightness and leak detection
  - piping design and testing requirements, appropriate standards and codes for various applications

More About A2Ls

- Most of the basic chemical/physical properties of next-generation refrigerants are very similar to previous generation (CFC/HCFC/HFC).
  - Many new refrigerants are blends that are currently part of Class A1 refrigerant blends (e.g., R-410A is 50% R-32, a Class A2L refrigerant)
- Compared to propane and natural gas, A2L refrigerants have much lower flammability risk due to:
  - Higher Lower Flammability Limit –> Higher concentration to become flammable
  - Higher Minimum Ignition Energy (MIE) –> harder to ignite
  - Lower Heat of Combustion –> less energy released if burned
  - Lower Burning Velocity –> more difficult for flames to spread
- Class A2L refrigerants are already being used safely -> Global auto industry (including U.S. and Canada) -> Air conditioning and refrigeration equipment in the European Union, Australia, Japan, Thailand and other countries -> Small appliances as approved by the Environmental Protection Agency (EPA)

What does it all mean for you?

- Safety first
  - PPE (fire extinguisher, safety glasses)
  - Proper tools and gauges (A2L compatible)
- Pay mind to the simple things
  - Don’t be distracted while working on the unit
    - Step away from the unit to take a call or call back after you complete what you are working on
  - Don’t be complacent. Approach with more caution because this is new to us
- Follow all protocols
  - As new developments unfold, we will work to update the team

Service Best Practices

- Follow typical refrigerant management best practices and be aware of new safety considerations:
  - which A2L refrigerant is being used?
  - check for refrigerant labels and red markings/stickers on the system
  - clearly mark them for the next technician who may service the system.
- Use A2L approved gauges, thread adapters, vacuum pumps, and leak detection and refrigerant recovery machines. When servicing or repairing A2L systems, follow 3 mandatory steps (which are already considered industry-accepted best practices):

1. Purge with nitrogen.
2. Evacuate the refrigerant.
3. Perform leak and pressure tests.

Servicing A2L Units (continued)

- Cut don’t unsweat to avoid potential issues with open flame
- Pull vacuum properly to avoid excess oxygen in line
- Never attempt to put A2L refrigerant in previous HVAC/R system
- Remember, this stuff isn’t scary -> follow your standard processes and proceed with caution and you will have no issues.

What are you seeing?



