

MODULE 1 • REFRIGERANT FUNDAMENTALS

Vocabulary Dictionary for Multilingual Learners

ESOL Supplemental Handout

Vocabulary Reference

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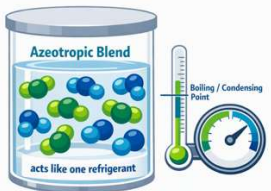
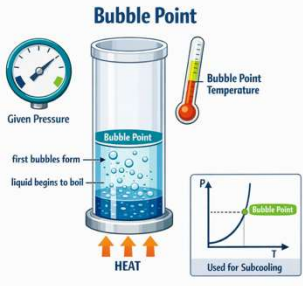
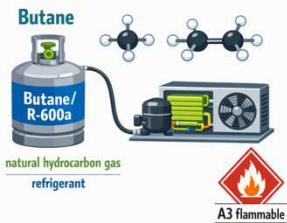
terms

VOCABULARY DICTIONARY

How to Use This Handout

This dictionary is organized alphabetically. Each entry includes a simplified definition and an image box. Instructors: insert a relevant photo into each image box before printing and distributing to students. Students can also add their own sketches or translations in the image box.

	TERM	DEFINITION	IMAGE
A			
•	ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers. ASHRAE assigns R-numbers (like R-454A, R-32) to refrigerants so technicians can identify them easily. Official logo from https://www.ashrae.org/about/marketing-central/branding-guide	The image shows the ASHRAE logo with the text 'sets standards'. Below it, a diagram illustrates the process of assigning R-numbers to refrigerants. A blue box labeled 'ASHRAE Standards' has an arrow pointing to three refrigerant cylinders labeled 'R-410A', 'R-32', and 'R-507'. The text 'refrigerant identification' is at the bottom.
•	Atmospheric Pressure	The weight of air pushing down on everything. At sea level, this is about 14.7 PSI. Refrigerants boil at low temperatures because of pressure changes.	The diagram is titled 'Atmospheric Pressure'. It shows a blue cylinder with arrows pointing down, labeled 'air pushes down'. To the right, a pressure gauge shows '14.7 PSI at sea level'. Next to it, a green refrigerant cylinder is shown with a thermometer, and a stack of books is shown with a thermometer. The text 'pressure affects boiling' is at the bottom.

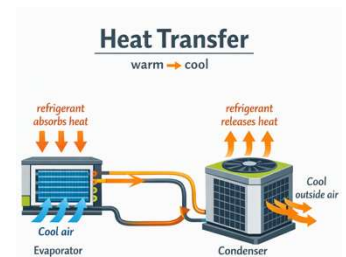
TERM	DEFINITION	IMAGE
Azeotropic Blend	A mixture of two or more refrigerants that behaves like a single refrigerant. Azeotropic blends boil and condense at one temperature at a given pressure. Refrigerants with R-numbers in the 500s are azeotropic blends. Example: R-507.	
B		
Bubble Point	The temperature at which a refrigerant blend first begins to boil at a given pressure. Bubble point and dew point are used to calculate subcooling and superheat for zeotropic blends.	
Butane	A natural hydrocarbon gas used as a refrigerant. Butane is flammable. It is classified as an A3 refrigerant.	
C		
Certification	Official proof that a person has passed the required exam. Technicians who work with refrigerants must have EPA Section 608 certification.	

TERM	DEFINITION	IMAGE
CFC (Chlorofluorocarbon)	An older type of refrigerant that damages the ozone layer. CFCs have been banned. Examples: R-11, R-12. If you find CFC refrigerant in an old system, it must be recovered properly.	
Condenser	The coil where the refrigerant releases heat. In cooling mode, this is the outdoor coil. Hot refrigerant gas cools down and becomes liquid here.	
D		
Dew Point	The temperature at which a refrigerant blend first begins to condense at a given pressure. The difference between bubble point and dew point is called temperature glide.	
E		
Evaporator	The part that makes cold air. Liquid refrigerant enters and absorbs heat from the indoor air. The refrigerant turns into gas. The air becomes cool.	
F		

TERM	DEFINITION	IMAGE
Flammable	Able to catch fire. Some refrigerants are flammable. Safety classifications use numbers: A1 = not flammable, A2L = low flammability, A3 = highly flammable. Technicians must follow extra safety rules with flammable refrigerants.	
G		
GWP (Global Warming Potential)	A number that shows how much a refrigerant contributes to global warming compared to carbon dioxide (CO₂). A lower GWP number is better for the environment. Newer refrigerants like HFOs have very low GWP.	
H		
HCFC (Hydrochlorofluorocarbon)	A type of refrigerant that partially damages the ozone layer. HCFCs are being phased out. Example: R-22, once common in home air conditioners.	

- Heat Transfer**

Heat moving from a warm place to a cooler place. This is how refrigeration works. Refrigerant absorbs heat in one place and releases it in another.



TERM	DEFINITION	IMAGE
HFC (Hydrofluorocarbon)	A type of refrigerant that does not damage the ozone layer but has a high Global Warming Potential. Examples: R-410A, R-134a. HFCs are widely used today but are being replaced by lower-GWP options.	

HFO (Hydrofluoroolefin)	A newer type of refrigerant with very low Global Warming Potential and no ozone depletion. Examples: R-1234yf, R-1234ze. HFOs are used in newer systems and in blends like R-454B.	
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O

ODP (Ozone Depletion Potential)	A number that shows how much a refrigerant damages the ozone layer. R-11 has an ODP of 1.0 (the baseline). An ODP of 0 means no ozone damage. Newer refrigerants (HFCs, HFOs) have an ODP of 0.	
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P

- P-T Chart (Pressure-Temperature Chart)**

A reference chart that shows the relationship between pressure and temperature for a specific refrigerant. Technicians use P-T charts to find saturation temperatures and check system performance.

Pressure (PSI)	Saturation Temp (°F)
100	37
120	42
140	47
160	52
180	58
200	65

The diagram shows a pressure gauge connected to a refrigerant line, with a label 'specific refrigerant' pointing to the gauge. A label 'pressure ↔ temperature' points to the gauge. A label 'find saturation temperature' points to the chart. A label '47°F' points to the saturation temperature on the chart. A label 'check system performance' points to a refrigerant unit.

TERM	DEFINITION	IMAGE
Pressure	Force pushing on a surface. In HVAC, we measure pressure in PSI (pounds per square inch). Pressure readings help you check if a system is working correctly.	

R

Refrigerant	The fluid inside an HVAC system. It absorbs heat in the evaporator and releases heat in the condenser. Common types: R-410A, R-454B (a newer A2L low-flammability refrigerant), R-32, R-22 (old systems).	
Refrigerant Blend	A mixture of two or more refrigerants combined to get better properties than a single refrigerant alone. Blends are classified as zeotropic (R-400 series) or azeotropic (R-500 series).	

S

Saturated	When a refrigerant is part liquid and part vapor at the same time during a phase change. At this point, the temperature and pressure have a direct relationship that can be read from a P-T chart.	
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TERM	DEFINITION	IMAGE
Section 608	The part of the U.S. Clean Air Act that covers refrigerant handling. Section 608 requires technicians to be certified and to follow rules for recovering, recycling, and reclaiming refrigerants.	
Subcooling	Cooling liquid refrigerant below its saturation temperature in the condenser. Measured by subtracting the actual liquid line temperature from the saturation temperature. Normal range is 10 degrees F to 20 degrees F.	
Superheat	Heating refrigerant vapor above its saturation temperature in the evaporator. After the refrigerant fully evaporates, it continues to absorb heat and becomes superheated. Too much or too little superheat indicates a problem.	
T		
Temperature Glide	The difference between the bubble point and dew point temperatures of a zeotropic refrigerant blend at a given pressure. Zeotropic blends experience temperature glide because their components change phases at different rates.	
V		

	TERM	DEFINITION	IMAGE
	Viscosity	How thick or thin a fluid is — its resistance to flowing. A refrigerant with low viscosity flows easily through the system, which reduces energy use and improves efficiency.	 Viscosity thick or thin Low Viscosity low = flows easy High Viscosity high = flows slow Less Energy Better Efficiency

Z

	Zeotropic Blend	A mixture of two or more refrigerants whose components change phases (liquid to gas) at different rates. Refrigerants with R-numbers in the 400s are zeotropic blends. Examples: R-410A, R-404A, R-454B.	 Zeotropic Blend R-400 series temperature glide Dew Point Glide Bubble Point parts change at different rates R-410A R-404A R-454B A2L
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