

Thermodynamics - Refrigeration Checklist For the PE Exam

Test Date: _____

Name: _____

		Confident	Knowledgeable	Need More Work
Refrigeration Basic Terms				
1.	<u>Temperature & Pressure</u> <i>What is the relationship between temperature and pressure? How does the boiling temperature of a liquid relate to pressure?</i>			
2.	<u>Enthalpy</u> <i>What is enthalpy? What are the units of enthalpy? What is the enthalpy of liquid? Enthalpy of vapor? Enthalpy of evaporation?</i>			
3.	<u>Entropy</u> <i>What is entropy? What are the units of entropy?</i>			
4.	<u>Specific Volume</u> <i>What is specific volume? What are its units? How does it relate to density?</i>			
5.	<u>Quality</u> <i>What is quality? What is the quality at the saturated liquid curve? What is the quality at the saturated vapor curve?</i>			
6.	<u>Super-Heat</u> <i>What is super heat? How does it relate to the saturated vapor point.</i>			
7.	<u>Sub-Cooling</u> <i>What is sub-cooling? How does it relate to the saturated liquid point?</i>			
8.	<u>Types of Refrigerants</u> <i>Can you indicate the types of refrigerants? Which types of refrigerants are allowed and which ones have been phased out?</i>			
9.	<u>ODP</u> <i>What does ODP stand for? Which refrigerants have 0 ODP?</i>			
10.	<u>GWP</u> <i>What does GWP stand for? Which refrigerants have low GWP?</i>			
11.	<u>Evaporator</u> <i>What is an evaporator? What function does it serve in the refrigeration cycle? What pressure does it operate at, low or high?</i>			
12.	<u>Compressor</u> <i>What is a compressor? What function does it serve in the refrigeration cycle?</i>			
13.	<u>Condenser</u> <i>What is a condenser? What function does it serve in the refrigeration cycle? What pressure does it operate at, low or high?</i>			
14.	<u>Expansion Device</u> <i>What is an expansion device? What function does it serve in the refrigeration cycle?</i>			

Navigating the Pressure-Enthalpy Diagram & Charts			
1.	Saturation Curve <i>Where is the saturation curve located? What does it represent? How does it distinguish between sub-cooled liquid, super-heat and the mixed region?</i>		
2.	Discharge/Suction Pressure <i>Can you plot discharge and suction pressures on a P-H diagram?</i>		
3.	Locating a Point <i>In the sub-cooled region, can you locate a point given the pressure and sub-cooled temperature? In the super-heat region, can you locate a point given the pressure and super-heat temperature? In the mixed region, can you locate a point given the pressure and enthalpy?</i>		
3.	Refrigeration Cycle <i>Can you plot the refrigeration cycle on a P-H diagram? Can you indicate the evaporator, compressor, condenser and expansion device movement?</i>		
4.	Constant Entropy <i>Can you find lines of constant entropy? Can you indicate movement on the constant entropy line for a compressor?</i>		
5.	Constant Enthalpy <i>Can you find lines of constant enthalpy? Can you indicate movement on the constant enthalpy line for a expansion device?</i>		
6.	Super-Heat/Sub-Cool <i>Can you find the point indicated by a certain degrees of super-heat or sub-cooling given a pressure?</i>		
7.	Net Refrigeration Effect <i>What is the net refrigeration effect? Can you find this amount and indicate it on a P-H diagram given the necessary information? What information is necessary to determine the net refrigeration effect?</i>		
8.	Net Condenser Effect <i>What is the net condenser effect? Can you find this amount and indicate it on a P-H diagram given the necessary information? What information is necessary to determine the net condenser effect?</i>		
9.	Compressor Work <i>What is the compressor work? Can you find this amount and indicate it on a P-H diagram given the necessary information? What information is necessary to determine the compressor work?</i>		
10.	COP <i>What is the COP? Can you calculate the COP?</i>		
11.	Resources <i>Do you have quick access to Refrigeration Diagrams for typical refrigerants and to Refrigerant tables?</i>		
Applicable Codes/References			
1.	ASHRAE 15 <i>Do you have ASHRAE 15? Are you familiar with the code?</i>		
2.	Montreal Protocol <i>Do you know the major decisions of the Montreal Protocol and how it relates to refrigerants?</i>		