Heat Transfer & System Fundamentals

Phase 5 BLOCK 1

Phase 5 — Block 1 Overview

Block 1 introduces the refrigeration principles that form the foundation of refrigerated dryer operation and troubleshooting. You'll develop an understanding of how heat moves through a refrigeration system, how refrigerants change state, and how pressure + temperature relationships are used to evaluate system performance. The concepts presented in this block serve as the basis for all subsequent refrigeration diagnostics, service procedures & troubleshooting activities throughout Phase 5.

Block Completion Requirements

For Block 1, complete all requirements listed below. Assigned *Absorb* resources can be accessed through the learning platform. Contact your mentor or supervisor if you need assistance with any topic or requirement.

1. ☐ **Review all *Absorb* resources**
2. ☐ **Complete all Articulate questions**
3. ☐ **Complete the Mastery Evaluation**

Absorb Resources

Refer to the DRW Learning Block online for the complete list of assigned resources for this block. Topics to review include:

AST580 TRAINING MATLS.

- Refrigeration Basics
- Refrigeration Components
- Refrigeration Analysis

SUPPLEMENTAL

- AST580 Prework Manual
- Refrigeration Videos
- Tech Direct Articles
- Manufacturer Resources

LMS REFRIGERATION

- Refrigeration Heat Cycle
- Refrigeration Components
- Refrigerant Analysis

Resources

Key Competencies

By completion of this Learning Block, technicians should demonstrate competency in:

- ☐ Heat Transfer Principles
- ☐ Sensible and Latent Heat
- ☐ BTU Fundamentals
- ☐ Refrigeration Cycle Operation
- ☐ Refrigerant State Changes
- ☐ Evaporator Function
- ☐ Condenser Function
- ☐ Pressure-Temperature Relationships
- ☐ Saturated Temperature
- ☐ P-T Chart Interpretation
- ☐ Superheat Fundamentals
- ☐ Subcooling Fundamentals
- ☐ TXV Operation
- ☐ TXV Sensing Bulb Function
- ☐ Refr. System Performance Evaluation
- ☐ System Heat Flow
- ☐ Glycol Circuit Verification
- ☐ Refrigerated Dryer Troubleshooting

Competencies

Name: _____ **Phase Start Date:** _____

DRW

Components & Control Devices

Phase 5 BLOCK 2

Phase 5 — Block 2 Overview

Learning Block 2 builds upon refrigeration fundamentals by introducing the components, controls, and metering devices that regulate refrigeration system operation. Technicians will learn how refrigerant flow is controlled, how system protection devices safeguard equipment, and how various control strategies influence dryer performance. By understanding the purpose and operation of these components, technicians will be better prepared to diagnose system faults, interpret operating conditions, and make informed troubleshooting decisions in the field.

Block Completion Requirements

For Block 2, complete all requirements listed below. Assigned *Absorb* resources can be accessed through the learning platform. Contact your mentor or supervisor if you need assistance with any topic or requirement.

1. ☐ **Review all *Absorb* resources**
2. ☐ **Complete all *Articulate* questions**
3. ☐ **Complete the *Mastery* Evaluation**

Absorb Resources

Refer to the DRW Learning Block online for the complete list of assigned resources for this block. Topics to review include:

AST580 TRAINING MATLS.

- Air & Refrigerant Flow
- NVC Heat Exchange Diagrams
- **Valves, Switches, Pumps & Metering Devices**

SUPPLEMENTAL

- Refrigeration Videos
- Tech Direct Articles
- Manufacturer Resources
- Control Device Op. & Troubleshooting Resources

DRYERS AT A GLANCE

- Refr. Dryer Op. & Components
- System Configurations

Resources

Key Competencies

By completion of this Learning Block, technicians should demonstrate competency in:

- ☐ Refrigeration Component Identification
- ☐ Refrigeration Component Functions
- ☐ Refrigerant Flow Control
- ☐ Thermostatic Expansion Valve (TXV) Op.
- ☐ Capillary Tube Operation
- ☐ Fixed vs. Modulating Metering Devices
- ☐ Refr. Dryer Diagnostic Methodology
- ☐ Superheat Application & Relevance
- ☐ High Pressure Cutout (HPCO) Operation
- ☐ Low Pressure Cutout (LPCO) Operation
- ☐ System Protection Strategies
- ☐ Fan Cycling Switch Operation
- ☐ Liquid Line Solenoid Operation
- ☐ Glycol Pump Function & Diagnostics
- ☐ Hot Gas Bypass Valve Operation
- ☐ Condensate Drain Systems
- ☐ Refrigeration Control Logic
- ☐ Alarm Recognition & Interpretation
- ☐ Component-Based Troubleshooting

Competencies

Name: _____ **Phase Start Date:** _____

DRW

System Relationships & Field Application

Phase 5 BLOCK 3

Phase 5 — Block 3 Overview

Learning Block 3 focuses on the relationships between pressure, temperature, phase change, and overall refrigeration system performance. Technicians will learn how to interpret P-T charts, evaluate saturated temperature conditions, and understand how refrigeration system readings relate to real-world operation.

Building upon the concepts introduced in Blocks 1 and 2, this Learning Block emphasizes diagnostic thinking and the ability to connect system measurements, component behavior, and field symptoms to accurately troubleshoot refrigerated dryer performance issues.

Block Completion Requirements

For Block 3, complete all requirements listed below. Assigned *Absorb* resources can be accessed through the learning platform. Contact your mentor or supervisor if you need assistance with any topic or requirement.

1. ☐ **Review all *Absorb* resources**
2. ☐ **Complete all Articulate questions**
3. ☐ **Complete the Mastery Evaluation**

Absorb Resources

Refer to the DRW Learning Block online for the complete list of assigned resources for this block. Topics to review include:

AST580 TRAINING MATLS.

- Dryers at a Glance
- Alarm Lists
- DPC Controller Operation
- Refr. Troubleshooting

SUPPLEMENTAL

- Refr. Dryer Alarm Interpretation
- Controller Operation References
- Manufacturer Resources
- Real-World Troubleshooting

SYSTEM PERFORMANCE

- Pressure-Temp. Relationships
- Saturated Temperature Concepts
- Refrigeration System Diagnostics

Resources

Key Competencies

By completion of this Learning Block, technicians should demonstrate competency in:

- ☐ Saturated Temperature Fundamentals
- ☐ Pressure-Temperature Relationships
- ☐ P-T Chart Interpretation
- ☐ Refrigerant Phase Change Analysis
- ☐ Refr. System Performance Evaluation
- ☐ Refrigeration System Diagnostics
- ☐ Alarm Recognition & Interpretation
- ☐ DPC Controller Operation
- ☐ Suction Pressure Evaluation
- ☐ Discharge Pressure Evaluation
- ☐ Superheat Interpretation
- ☐ Subcooling Interpretation
- ☐ Refrigeration Component Interaction
- ☐ Field Symptom Analysis
- ☐ Root Cause Identification
- ☐ High Pressure Condition Diagnostics
- ☐ Refr. Dryer Troubleshooting Methodology
- ☐ Real-World System Evaluation

Competencies

Name: _____ **Phase Start Date:** _____

DRW