

## NATIONAL METAL AND ENGINEERING CURRICULUM

**MODULE:** CAPILLARY SYSTEMS (NR029)

**PURPOSE:** This module aims to provide the student with the knowledge and skills to select and replace a capillary tube, and return the system to service.

**NOMINAL DURATION:** One module

This module is *designed on* the assumption that most of the students will achieve the competencies specified in 17.5 to 20 hours.

The length of time taken to complete a module will vary depending on factors such as teaching *method used*, knowledge and skills at entry and individual student's ability.

**PREREQUISITES:** Refrigeration System Components (NRO04)

**LEARNING OUTCOMES:** On completion of this module the student will be able to:

1. Identify the dangers and observe safety procedures in the installation and repairs of a capillary tube system.
2. List the different capillary tubes and their function in domestic refrigerators and freezers.
3. Identify, repair or replace the capillary tube in a refrigeration system in accordance with the Code of Practice.
4. Select from manufacturers catalogues correct replacement capillary tube for a given application.
5. Identify the procedures necessary in the commissioning and servicing of a capillary tube system.

**STUDENTS SHOULD BE MADE AWARE OF OCCUPATIONAL HEALTH AND SAFETY ISSUES IN ALL SITUATIONS AND BE EXPECTED TO DEMONSTRATE SAFE WORKING PRACTICES AT ALL TIMES.**

**OUTLINE OF CONTENT:**

This module contains:

1. **Dangers and safety procedures**
  - Identify electrical hazards
  - Use safe electrical practices
  - Identify ozone depleting substances and use correct removal and storage procedures
2. **Operation and function of a capillary tube system**
  - type of tubes
  - application
  - characteristics
  - function
  - system unloading
  - calculating system
  - operating pressures
  - critical length
  - critical charge
3. **Repair/replacement of a capillary tube, refrigeration faults**
  - use of vacuum pumps/correct refrigerant charging procedure
4. **Use of manufacturers catalogues**
  - the use of refrigeration catalogues/service manuals to select replacement capillary tubes.
5. **Procedures for commissioning and servicing a capillary tube system.**
6. **Domestic Refrigeration Code of Practice,**

**ON-THE-JOB TRAINING:**

For consolidation, the material in this module should be linked with and complemented by relevant on-job skill practice or other equivalent experience.

**PERFORMANCE CRITERIA:**

The criteria for each learning outcome should be:

**Learning Outcome 1**

**Assessment:**

Short answer test.

**Performance:**

- a. Identify electrical hazards.
- b. Identify system refrigerant.
- c. List correct procedures to remove/store refrigerant from a system in accordance with the Code of Practice.
- d. Identify current local and national regulations relating to refrigerants and systems.

**Learning Outcome 2**

**Assessment:**

Short answer test.

**Performance:**

- a. List various types of capillary tubes and applications.
- b. Describe operating characteristics.
- c. Determine correct operating pressures.

**Learning Outcome 3**

**Assessment:**

Practical test.

**Performance:**

- a. Remove refrigerant from the system in accordance with Code of Practice.
- b. Replace the capillary tube.
- c. Pressure test the system.
- d. Evacuate and recharge the system.
- e. Return the system to normal operation.

**Learning Outcome 4**

**Assessment:**

Short answer test.

**Performance:**

- a. Select capillary tube from manufacturer data.
- b. Select alternate size tubes from given data.

**Learning Outcome 5**

**Assessment:**

Practical test.

**Performance:**

- a. Identify and repair faults in systems.
- b. List faults within systems given symptoms and observations.
- c. Use appropriate test equipment and procedures to make safe, isolate/replace and re-energise electrical components.
- d. Diagnose faulty components in domestic refrigeration systems and select from manufacturers catalogues correct or replacement components.