

---

## 1. Module details

**Module name**

### **REFRIGERATION PROCEDURES**

**Nominal duration**

One module  
It is anticipated that students will achieve the competencies specified in 35 to 40 hours.

**Module codes**

**NR002**

**Discipline code**

## 2. Module purpose

To provide the student with the knowledge and skills that are fundamental to the refrigeration and air conditioning industry.

## 3. Prerequisites

Nil

## 4. Relationship to competency standards

TBA

## 5. Content

1. Types of tubing
  - tubing cleanliness
  - annealing
  - use of dry nitrogen safety with nitrogen
  - bending methods spring bending tools (lever type)  
measurement and marking out gain correction
2. Flaring
  - types of block
  - types of flare nut
  - expanding
  - tube expanders
  - swaging
  - recognition of fittings and threads
  - thread sealants
  - oxygen acetylene and/or air acetylene equipment
  - cylinder and equipment safety
  - setting up equipment
  - operating techniques
  - flame types
  - silver brazing
  - joint preparation
  - copper to copper dissimilar metals brazing alloys
  - fluxes
3. Job preparation refrigerant isolation/pump down
  - protection of cabinets from flame brazing in tight corners
  - use of mirrors pressure testing
4. Types of gauges

---

## **6. Learning outcome details**

### **Learning outcome 1**

#### **Assessment criteria**

### **Learning outcome 2**

#### **Assessment criteria**

### **Learning outcome 3**

#### **Assessment criteria**

### **Learning outcome 4**

#### **Assessment criteria**

- care and maintenance of gauges and hoses
- service valves
- schraeder valves
- piercing valves
- fitting gauges
- purging lines
- reading gauges
- using P.T chart
- removing gauges with minimal
- refrigerant loss

#### **5. Types of gasket material**

- thickness of gaskets
- measuring and marking out
- use and care of wad punches

On the completion of this module, the learner will be able to:

Accurately and neatly bend copper tube to specification.

1.1 Observe safety precautions.

1.2 Bend tubing to specification using appropriate tools.

Construct mechanical and brazed joints in refrigerant tubing that meet specification.

2.1 Observe safety precautions.

2.2 Construct leak proof flares to specification.

2.3 Expand and join both similar and dissimilar tubing by silver brazing.

2.4 Identify various fittings (threads, size, appropriate spanners).

Replace or repair components in refrigerant system piping to specification.

3.1 Observe safety precautions.

3.2 Conserve refrigerant by isolation and pump down.

3.3 Repair and replace components in refrigeration systems without damage to cabinet or other components.

Fit and remove service gauges to operating refrigeration systems and carry out appropriate leak testing.

4.1 Observe safety precautions.

4.2 Select and fit Schraeder and Piercing valves to refrigeration

	<p>systems.</p> <p>4.3 Fit and remove service gauges to refrigeration systems with minimal refrigerant loss, including leak detection.</p> <p>4.4 Use gauges to identify saturation temperatures in a refrigeration system.</p> <p>4.5 Describe construction of service gauges and manifold.</p> <p>4.6 Describe care and maintenance requirements of service gauges, manifolds and flexible hoses.</p> <p>4.7 Explain function and care of service valves (back seat, front seat etc.)</p>
<b>Learning outcome 5</b>	Manufacture replacement gaskets for valve plates and service valves.
<b>Assessment criteria</b>	<p>5.1 Observe safety precautions.</p> <p>5.2 Select appropriate gasket materials for different applications.</p> <p>5.3 Manufacture gaskets for particular applications.</p> <p>5.4 Demonstrate correct use and care of tools and equipment used.</p>
<b>7. Assessment Strategies</b>	<p>Practical exercises.</p> <p>Written test.</p>
<b>8. Module Delivery Strategies</b>	<p>Delivery strategies must be suitable for both theoretical and /or practical learning and module purpose.</p> <p>It recommended that learning and assessment be facilitated in a holistic manner which may require a learning outcome sequence other than that indicated in the body of this module.</p> <p>Also, an integrated theory/practice approach should be used where students learn by practical exercises and through research and workshop reports.</p>
<b>9. Resource Requirements</b>	<p>Appropriate practical equipment, service manuals, schematic diagrams test equipment.</p> <p>Useful references include:</p> <p>Australian Refrigeration and Air Conditioning, Volumes I &amp; II, A CR &amp; D Project Trust Publication.</p>

---

## **10. Occupational health and safety requirements**

Dossat R.J., Principles of Refrigeration, Second Edition, SI Version, John Wiley and Sons, New York. Latest Edition.

ASHRAE Handbook, Refrigeration Systems and Applications., SI Version, ASHRAE, Atlanta.

A safe and healthy environment will be provided for students in regards to classroom and workshop safety.