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**Assessment of Skill**

## Qualification

**Unit Number Unit Name**

**Event ID**

**Student Name RTO Identifier Class/Group ID**

**Student Declaration**

22329VIC Course in Heating, Ventilation and Air Conditioning Services

VU22583

Handle Class A2/A2L Flammable Refrigerants

**Skill Assessment 1 - R32 Split Air Conditioning System Commissioning and De-commissioning**

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* I confirm that no part of this assessment has been copied from any other source.
* This assessment contains my own work.
* Where reference to other people' s work has been permitted, I have identified the source.

## Student

**Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Overview**

**Items Required**

**Validation**

**Industry Support**

**Copyright Notice**

**Instructions**

This is a practical assessment designed to assess your ability to safely handle, use and store A2/A2L classified flammable refrigerants.

It includes working safely while pressure testing, evacuating, charging and recovering A2/A2L refrigerant from an R32 split air conditioning system; complying with relevant legislative, regulatory/licensing, standards and codes requirements; relevant performance characteristics; manufacturer’s recommendations/ instructions and industry practices; and completing the necessary documentation.

**An** Observation Checklist is attached to the back of this assessment document. Read it before you commence this assessment. It provides the specific criteria you will be assessed against.

The training facility will provide access to the equipment necessary to perform the skills covered in this assessment event. This includes an installed R32 split air conditioning system, refrigerant recovery equipment, evacuation and charging equipment, tools, and measuring instruments, pressure testing equipment, leak testing equipment, dry nitrogen equipment, R32 refrigerant, lubricants and consumables.

You will be required to provide the appropriate:

* Pens/Pencils
* Scientific calculator
* Personal Protective Equipment

This assessment has been approved for use by representatives of the Refrigeration and Air Conditioning Industry Validation Committee. This training facility can provide further details upon request.

This assessment has been produced by the Australian Refrigeration Council and Refrigerants Australia.

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* Mobile phones are to be turned off and removed from your person. You cannot access a mobile phone during this assessment.
* You may use any text or reference book or notes for this assessment.
* All examination papers and other working papers to be clearly marked with your name.
* The whole of this assessment is to be handed to the Assessor upon completion.
* All sections must be attempted.
* You will not be permitted to carry out this assessment if you do not have the required Personal Protective Equipment (safety glasses, correct clothing, and correct footwear).

## Activity 1 - Work Preparation/Inspection Checklist

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Complete this checklist by:   * Placing an **X** in either the **YES** or the **NO** column for each statement below (use **NA** where an item is not applicable to this work) * **Do not start work if you have placed an 'X' in a box that is shaded.** Discuss the situation with your assessor before going any further. Record any requirements/recommendations made by the assessor in the comments box below. | | | | | YES | **NO** |
| 1 | I have received instructions and understand the task requirements. | | | |  |  |
| 2 | I am physically and mentally fit to perform the task (I am not affected by fatigue, drugs or alcohol). | | | |  |  |
| 3 | I have received an induction for the work area where the task is to be performed. | | | |  |  |
| 4 | I am wearing the appropriate PPE for the task. | | | |  |  |
| 5 | My mobile phone is off and will remain off for the duration of this assessment (unless otherwise authorised by your assessor) . | | | |  |  |
| This work requires the handling of a controlled substance (i.e. Refrigerant):  **ARC License No.**  **Expiry Date: \_\_**  License Verified: **Yes No** (assessor to circle) | | **Comments:**  ·\ | | | | |
| **Student name:** | | | **Signature:** | **Date:** | | |

**Activity 2: Risk Assessment**

### Task

Carry out a Risk Assessment for a work area containing the R32 air conditioning system and the R32 refrigerant cylinder.

**Procedure**

1. Identify and record the details below of the R32 system and cylinder/s in the work area:

|  |  |  |  |
| --- | --- | --- | --- |
| **R32 Air conditioning system** | | **R32** **Refrigerant cylinder/s** | |
| System Type |  | Cylinder size |  |
| System Make |  | Refrigerant weight in cylinder |  |
| System Model Number |  | Recovery cylinder size |  |
| Refrigerant Type |  | Refrigerant weight in cylinder |  |
| Refrigerant Charge |  |  |  |

1. Inspect the work area and record on the following table:
   1. **Risks/hazards,** especially those associated with A2/A2L system or cylinders including electrical, mechanical and ignition hazards, low spots and trench ' s, etc.
   2. Possible **'consequences of the hazards'** (how you or others may be injured).
   3. **Risk class** (A, B or C} using the table below.

|  |  |  |
| --- | --- | --- |
| **Risk Classification** • | | |
| ***A*** | High risk | Potential death or permanent disablement} |
| ***B*** | Medium risk | Potential serious injury/ illness and temporary disablement} |
| ***C*** | Low risk | Potential minor injury, no lost time) |

* 1. **Control measures** required to minimise each of the risks.

**Risk Assessment**

|  |  |  |  |
| --- | --- | --- | --- |
| **a) Risk or Hazard** | b) **Consequence of the hazard** | **c) Risk Class** | d) **Control Measures** |
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**Activity Completed Competently YES/NO Assessors Initials:** ............... **Date: ..................**

# Activity 3: Access System

### Task:

Connect service gauges to the outdoor unit.

You will be assessed during the activity on your ability to demonstrate that you can:

* Comply with all applicable WH&S requirements and hazard control measures.
* Isolate the electrical supply and tag it.
* Set up an appropriate temporary flammable zone
* Use appropriate tools and techniques to access the system's refrigerant system
* Correctly connect service gauges to outdoor unit.

**Activity Completed Competently YES/NO Assessors Initials: ............Date:** ..................

**Activity 4: Pressure Test and Repair Leaks**

**Task:**

Pressure test and repair, if necessary, any leaks found on the R32 system's interconnecting pipework and fittings.

You will be assessed during the activity on your ability to demonstrate that you can:

* Comply with all applicable WH&S requirements and hazard control measures.
* Determine the appropriate pressure test value suitable for the application/system type.

Pressure testing level for the system you are working on:

High side kPa Low side kPa

**Do not proceed any further until your assessor has checked and approved these values.**

* Correctly connect an Oxygen Free Dry Nitrogen cylinder and regulator.
* Safely introduce Oxygen Free Dry Nitrogen into the system to required pressure level.
* Test the refrigerant pipework for leaks using an accepted method and repair any leaks found appropriately.
* Discharge Oxygen Free Dry Nitrogen from the system safely and in a controlled manner.

**Activity Completed Competently YES/NO Assessors Initials: ...............Date:...............**

**Activity 5: Evacuate System**

### Task:

Evacuate the interconnecting pipework and indoor unit.

You will be assessed during the activity on your ability to demonstrate that you can:

* Comply with all applicable WH&S requirements and hazard control measures.
* Correctly fit service gauges to the system for evacuation.
* Check the vacuum pump for efficiency prior to starting evacuation.
* Fit the measuring device suitable for reading the vacuum level.
* Regularly check gauge connections are for tightness during the evacuation
* Evacuate the interconnecting pipework and indoor unit using 'Deep Evacuation" method to the required level.

Vacuum Required?

Vacuum Obtained?

* Provide a description of 'Triple Evacuation.
* Disconnect the vacuum pump ensuring that no loss of vacuum occurs.
* Prepare the system for re-charging with refrigerant.
* To ensure a vacuum pump retains efficient operation, describe the maintenance activity that should be carried out on it regularly?

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### Activity Completed Competently YES/NO Assessors Initials: ...............Date: .............

**Activity 6: Open R32 Charge into Interconnecting Pipework**

#### Task:

Release outdoor unit's R32 charge into interconnecting pipework and indoor unit.

You will be assessed during the activity on your ability to demonstrate that you can:

* Comply with all applicable WH&S requirements and hazard control measures.
* Connect service gauges to the system correctly
* Open the outdoor unit's service valves to release the R32 charge into interconnecting pipework and indoor unit until pressures equalize.

#### Under the teacher's supervision turn on the system.

#### Measure and record system's operating pressures, temperatures and current on the table below.

|  |  |  |
| --- | --- | --- |
| **Condition** | **Cooling Mode** | **Heating Mode** |
| Ambient Temperature: |  |  |
| Suction Pressure: |  |  |
| Evaporation Temperature: |  |  |
| Discharge Pressure: |  |  |
| Condensing Temperature: |  |  |
| Compressor Rated Full Load Current: |  |  |
| Compressor Operating Current: |  |  |

* Confirm if the system is operating correctly per manufacturer's specifications and instructions: Yes/No

Comments:

* Confirm if the system is operating with the correct refrigerant charge per manufacturer's specifications:

Yes/No Refrigerant charge \_

* Disconnect service gauges from the system safely and with no loss of refrigerant charge.
* Seal access valves
* Carry out a final leak test and repair any leaks
* Leave the system as required - check with your assessor if it is to be left operating.

**Activity Completed: YES/NO Teacher's Initials: ...............Date:** .............

**Activity 7: Complete Documentation**

**Task:**

Check operation and document relevant information of the R32 system as required by relevant regulations, codes, standards and the manufacturer.

You will be assessed during the activity on your ability to demonstrate that you can:

* Pack away all tools and equipment correctly
* Remove any rubbish from work area,
* Leave the work area safe for others.
* Complete the 'service tag' below, filling in the relevant information.

Refrigerant type used: Refrigerant oil type used: Ultraviolet dye added : Service person name: Service person ARC Licence no:

Business name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date of service:

[www.lookforthetick.com.au](http://www.lookforthetick.com.au) 

**Activity Completed: YES/NO Teacher's Initials: ............Date:** ..................

**Activity 8: Decommission the System**

**Task:**

Safely remove the R32 refrigerant charge from the system.

This shall be achieved by recovering the refrigerant into a suitable cylinder and applying approved techniques and in compliance with all applicable WH&S requirements and hazard control measures.

You will be assessed during the activity on your ability to demonstrate that you can:

* Comply with all applicable WH&S requirements and hazard control measures.
* Connect service gauges to the system correctly
* **Isolate the electrical supply and tag it.**
* Connect the A2/A2L recover unit and A2/A2L recover cylinders
* Recover all of the refrigerant from the system.
* Record the quantity of refrigerant recovered kg
* Leak test recovery cylinder and repair any leak found.
* Store the refrigerant recovery cylinder in suitable location
* Attach De-Gassed sticker to decommissioned units, available at: <https://www.arctick.org/information/promotional-material/>



* Pack away ail tools & equipment correctly
* Remove any rubbish from work area
* Leave the work area safe for others.
* Record any safety related issues below so they can be reported to appropriate person/s.

**Activity Completed: YES/NO Teacher's Initials: ............Date:** ..................

**Additional Questions**

Your Assessor may choose to ask verbal questions to clarify your understanding of a topic. This page is provided for the assessor to list any additional questions that were asked, together with your response.

**Observation Checklist**

The following Observation Checklist will be used by your assessor to record your performance. It identifies the assessment criteria that will be used to determine whether you have successfully completed this assessment event. All the criteria must be met successfully. This demonstration will be used as part of the overall evidence requirements of this unit.

**Note:** The abbreviations in the table below carry the following meaning:

S - SATISFACTORY

U/S- UNSATISFACTORY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Prepare to work with A2/A2L flammable refrigerants** | | | | | |
| **Performance** | | **Activity Number** | **S** | **U/S** | **Assessor Comments**  (Describe the student's ability to perform the required skills) |
| P1 | Clarify WHS/OHS requirements and environmental requirements for a given work area with appropriate personnel. | 1 |  |  |  |
| P2 | Identify hazards and control measures and procedures before commencing work | 2 |  |  |  |
| P3 | Establish the scope and nature of work to be undertaken from documentation and/or from work, site or building supervisor and/or end user. | 1 to 8 |  |  |  |
| P4 | Select and obtain the materials, tools and equipment, measuring and testing devices, and personal protective equipment needed to carry out the work and check them for correct operation. | 3 to 8 |  |  |  |
| P5 | Transport refrigerant in accordance with relevant regulations, standards and codes of practice requirements | N//A |  |  |  |
| P6 | Check tools and fittings are appropriate for the refrigerant type and designed to prevent/minimize refrigerant loss. | 3 to 8 |  |  |  |

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Recover, pressure/leak test, evacuate and charge systems using A2/ A2L flammable refrigerants** | | | | | |
| **Performance** | | **Activity Number** | **S** | **U/S** | **Assessor Comments**  (Describe the student's ability to perform the required skills) |
| P7 | Carryout the work in accordance with established  WHS/OHS and environmental risk control measures and procedures, relevant regulations, standards, codes of practice, safety guides & safety systems. | 3 to 8 |  |  |  |
| P8 | Confirm that the system is electrically isolated and appropriately tagged/locked off. | 3 to 8 |  |  |  |
| P9 | Pump down the system or recover the refrigerant safely into labelled recovery cylinder/s that complies with the relevant standard | 8 |  |  |  |
| P10 | Pressure test the system using dry nitrogen at the required pressure for the refrigerant to be used without causing damage | 4 |  |  |  |
| P11 | Evacuate the system to ensure removal of moisture and other contaminants and using an appropriate vacuum pump and gauge | 5 |  |  |  |
| P12 | Repair refrigerant leaks before charging with refrigerant | 4 to 6 |  |  |  |
| P13 | Charge the system with the A2/A2L refrigerant in accordance with manufacturer's specifications/  instructions and industry practices | 6 |  |  |  |
| P14 | Measure and record the system's operating conditions and ensure system is operating within manufacturer's specifications | 6 |  |  |  |
| P15 | Leak test the system | 4 and 6 |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Complete work and relevant documentation** | | | | | |
| **Performance** | | **Activity Number** | **S** | **U/S** | **Assessor Comments**  (Describe the student's ability to perform the required skills) |
| P16 | Complete the work following WHS/OHS risk control measures and procedures, relevant regulations,  standards, codes of practices, safety guides and safety systems. | 6, 7, 8 |  |  |  |
| P17 | Clean and make safe the work site in accordance  with established procedures | 7 |  |  |  |
| P18 | Dispose of contaminated refrigerant | N/A |  |  |  |
| P19 | Store refrigerant in accordance with regulatory requirements | 8 |  |  |  |
| P20 | Clean, check and securely store tools and equipment | 7 and 8 |  |  |  |
| P21 | Report any safety related issues to appropriate  person/s. | 8 |  |  |  |
| P22 | Complete required documentation in accordance with established enterprise procedures | 7 and 8 |  |  |  |

**Assessment Feedback**

***NOTE: This section must have the assessor signature and student signature to complete the feedback.***

**Assessment outcome**

□ Satisfactory □ Unsatisfactory

**Assessor Feedback**

YES NO This assessment event was successfully completed

Reasonable adjustment was in place for this assessment event

*{If yes, ensure it is detailed on the assessment document)*

Comments:

**Assessor name, signature and date:**

**Student acknowledgement of assessment outcome**

Would you like to make any comments about this assessment?

**Student name, signature and date**

***NOTE: Make sure you have placed your initials at the bottom of each page of this document before submitting to your assessor***