

**BANGLADESH TECHNICAL EDUCATION BOARD**



**NATIONAL COMPETENCY STANDARDS**

**For**

**Refrigeration and Air Conditioning**

**(Pre vocational qualification level - 2)**

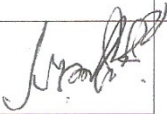


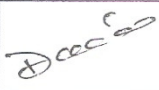
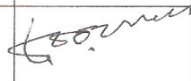
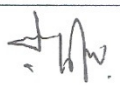

**Agro Food Processing Industry Skills Council  
Bangladesh**

**BANGLADESH TECHNICAL EDUCATION BOARD  
September 2013**

## Table of Contents

Sl. No.	Description	Page No.
1	Approval of SCDC committee on meeting held on 27.08.2013.	3
2	National Competency Standards Pre voc 2	4
<b>Generic – Compulsory (4 UoCs required)</b>		5
3	Apply Basic Mathematics.	6-8
4	Apply Occupational Safety & Health (OSH) practice in the Work place.	9-11
5	Apply basic English.	12-13
6	Apply basic Bangla.	14-16
<b>Sector Specific Compulsory (1 UoC required)</b>		17
7	Use hand tools, equipment and materials for servicing of refrigerator and freezer in the workplace	18-21
<b>Occupation Specific – Compulsory (4 UoCs required)</b>		22
8	Demonstrate the operation of mechanical refrigeration cycle.	23-25
9	Demonstrate domestic refrigerator and deep freezer.	
10	Service domestic refrigerator.	26-30
11	Service deep freezer.	31-35

**Bangladesh Technical Education Board**  
**Standard Curriculum Development Committee**  
**NATIONAL COMPETENCY STANDARDS**  
**for**  
**Refrigeration and Air Conditioning NTVQF Level 1**  
**Meeting held on 27.08.2013**

Sl. No	Name of members Contact number	Address,	Designation	Signature	Remarks
1.	Ahsan Ibne-Noor Managing Director 01711404826	R Industries Ltd Factory-Nanduyan, Kaultion, Gazipur.	Chair Person		CS Documents Approved
2.	Ahsanul Kabir Mallik Engineer 01911018102	SITAK Prakausali	Member		
3.	Md. Siddique Proprietor 01711175952	Siddique Electric & Refrigeration Co. Mirpur, Djaka	Member		
4.	M A Hannan Proprietor 01711182524	Ansar Refrigeration Co. Mirpur, Dhaka.	Member		
5.	Md. Solaiman 01716034111	Road # 6, House # 9, Swection 12, Pallabi, Dhaka	Member		
6.	Md. Redwanur Rahman, Instructor (Power) 01819144515	Dhaka Polytechnic Institute, Dhaka	Member		
7.	Md. Ziaul Hoque Sikder Sr. Instructor 01552446435	Bangla German TTC, Mirpur, Dhaka.	Member		
8.	Md. Sahahdat Hossain, Curriculum Specialist 01558439769	Bangladesh Technical Education Board, Dhaka.	Member		

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**NATIONAL COMPETENCY STANDARDS**  
**For**  
**Refrigeration and Air Conditioning: Pre-voc 2**  
**Structure of Competency**

Sl. No	Unit Code and Title		UoC Level	Nominal Duration (Hours)
<b>Generic – Compulsory (4 UoCs required)</b>				<b>180</b>
1.	GNMATHPV2001A1	Apply basic mathematics	Pre-voc 2	40
2.	GNOSHPV2002A1	Apply Occupational Safety and Health practice	Pre-voc 2	20
3.	GNENGPV2003A1	Apply basic English	Pre-voc 2	60
4.	GNBANPV2004A1	Apply basic Bangla	Pre-voc 2	60
<b>Sector Specific – Compulsory (1 UoC required)</b>				<b>30</b>
5.	RACSSPV2005A1	Use hand tools, equipment and materials for servicing of refrigerator and freezer in the workplace.	Pre-voc 2	30
<b>Occupation Specific – Compulsory (4 UoCs required)</b>				<b>150</b>
6.	RACOSPV2006A1	Demonstrate the operation of mechanical refrigeration cycle.*	Pre-voc 2	40
7.	RACOSPV2007A1	Demonstrate domestic refrigerator and deep freezer.*	Pre-voc 2	40
8.	RACOSPV2008A1	Service domestic refrigerator.*	Pre-voc 2	40
9	RACOSPV2009A1	Service deep freezer.*	Pre-voc 2	30
<b>Grand total</b>				<b>360 Hrs</b>

\*Transacted from NTVQF Level-1

# **GENERIC UNITS**

**Pre-voc 2**

**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>GNMATHPV2001A1: Apply basic mathematics.</b>
<b>Nominal Hours</b>	<b>40 Hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to apply mathematical method such as addition, subtraction, multiplication and division to measure and find out dimension of object in the workplace.</b>
<b>Elements of Competency</b>	<b>Performance Criteria <i>Italicized terms are elaborated in the range of variables</i></b>
1. Read and write numeric numbers in Bangla and English.	1.1. Numerical numbers from 0 to 9 in Bangla and English is recognized. 1.2. Arrangement in ascending and descending order of numbers in English and Bangla is demonstrated. 1.3. Reading and writing of numerical numbers in Bangla and English are demonstrated.
2. Use mathematical methods.	2.1. <b><i>Addition, subtraction, multiplication and division</i></b> are applied. 2.2. Addition of numbers is carried out. 2.3. Subtraction of numbers from other numbers is demonstrated. 2.4. Multiplication of numbers with other numbers is demonstrated. 2.5. Division of numbers by other numbers is carried out. 2.3. Addition, subtraction, multiplication and division In decimal system are solved. 2.4. Percentage of numbers is calculated.
3. Measure in Metric system.	3.1. Units of measurement of length, breadth, height, weight and thickness in metric system is used. 3.2. Measurement of area and volume of solid and liquid in metric system is carried out. 3.3. Measurement of time is applied.
4. Measure in British system.	4.1. Units of measurement of length, breadth, height, weight and thickness in British system are used. 4.2. Measurement of area and volume of solid and liquid in British system is carried out. 4.3. Measurement of time is applied.

<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b>
1. Mathematical methods of addition, subtraction, multiplication and division	Mathematical methods include but not limited to. 1.1. Addition up to six digits is applied. 1.2. Subtraction up to six digits is applied. 1.3. Multiplication up to six digits is applied. 1.4. Division up to six digits is applied. 1.5. Calculation of percentage. 1.6. Calculation of area and volume.
<b>Evidence Guide</b>	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency.	1.1. Calculation using addition, subtraction, multiplication and division. 1.2. Measurement of area and volume.
2. Underpinning knowledge.	2.1. Calculation requirements in the workplace. 2.2. Selection of appropriate mathematical methods. 2.3. Use of tools and equipment. 2.4. Symbols and terminology. 2.5. Use of units.
3. Underpinning skill.	3.1. Selection of appropriate mathematical methods from workplace information. 3.2. Selection of workplace information (Charts, tables, equipment, manuals). 3.3. Application of required skills in the workplace.
4. Required attitude.	4.1. Commitment to occupational safety and health. 4.2. Promptness in carrying out activities. 4.3. Tidiness and timeliness. 4.4. Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5. Sincere and honest to the duties. 4.6. Eagerness to learn. 4.7. Communication with peers, sub-ordinates and seniors in the workplace.
5. Resource implication.	The following resources must be provided. 5.1. Calculator. 5.2. Measuring tape. 5.3. Ruler. 5.4. Marking chalk. 5.5. Ball pen. 5.6. Pencil. 5.7. Marker pen. 5.8. White board. 5.9. Flip charts. Tools, equipment and physical facilities. 5.10. Materials and consumables. 5.11. Multimedia.

6. Assessment methods.	Assessment methods may include but not limited to. 6.1. Continuous assessment 6.2. Oral question 6.3. Observation 6.4. Assignment 6.5. Witten test
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.

**Accreditation Requirements**

Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirement set by BTEB.



**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>GNOSHPV2002A1: Apply Occupational Safety &amp; Health (OSH) Practice in the workplace</b>
<b>Nominal Hours</b>	<b>20 Hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to apply Occupational Safety &amp; Health (OSH) practice in the workplace.</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><i>Italicized terms are elaborated in the range of variables</i></b>
1. Follow occupation safety and health environment at workplace.	1.1. Personal Protective Equipment ( <b><i>PPE</i></b> ) is used. 1.2. <b><i>Hazards at workplace</i></b> explained. 1.3. Unsafe tools at workplace are listed. 1.4. Flammable materials are recognized. 1.5. Access and storable materials are preserved in designated place. 1.6. <b><i>OSH materials, resources</i></b> and equipment are used safely according to specifications, legislation and standard operating procedures.
2. Perform work in safe condition.	2.1. Safe OSH practices are followed. 2.2. Appropriate personal protective equipment (PPE) are used. 2.3. Safety signs, symbols and banners are displayed. 2.4. Location of the fire fighters is identified. 2.5. Clear and free emergency exit passage maintained.
3. Use first aid kits.	3.1. Contents in the <b><i>first aid kit</i></b> are selected. 3.2. First aid kit in emergency is used.
4. Maintain healthy and hygiene workplace.	4.1. Aspect of good housekeeping is explained. 4.2. Washing procedure of hands and parts of body is used. 4.3. Useable cleaning agents at workplace is selected. 4.5. Safe drinking water is made available.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b>
1. Hazard at workplace.	Hazard may includes but not limited to. 1.1. Accumulation of waste materials. 1.2. Random storage of tools, equipment and furniture. 1.3. Storage of rejected wires, cables and structural materials. 1.4. Storage of flammable materials. 1.5. Congested emergency exit. 1.6. Oil splits floor, passage at workplace.

2. OSH materials and resources.	<p>OSH materials and resources include but not limited to.</p> <ol style="list-style-type: none"> <li>2.1. Hand gloves.</li> <li>2.2. Mask.</li> <li>2.3. Apron.</li> <li>2.4. Cap.</li> <li>2.5. Goggle.</li> <li>2.6. Safety shoes.</li> <li>2.7. Cautionary signs, symbols and banners to be displayed.</li> <li>2.8. Evacuation program.</li> <li>2.9. Fire extinguisher.</li> <li>2.10. Emergency lights, signals.</li> <li>2.11. Instructions for safety (Posters).</li> <li>2.12. Stretcher.</li> </ol>
3. First aids kit.	<p>First aids kit includes but not limited to.</p> <ol style="list-style-type: none"> <li>3.1. Sterilized cotton.</li> <li>3.2. Bandage.</li> <li>3.3. Scissors.</li> <li>3.4. Washing agent for injury.</li> <li>3.5. Medicine for burn.</li> <li>3.6. Medicine for sudden head-ache.</li> </ol>
<p><b>Evidence Guide</b>  The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.</p>	
1. Critical aspect of competency.	<ol style="list-style-type: none"> <li>1.1. Use of appropriate OSH materials and equipment.</li> <li>1.2. Handling of OSH materials and equipment.</li> </ol>
2. Underpinning knowledge.	<ol style="list-style-type: none"> <li>2.1. Maintenance of good OSH condition in workplace.</li> <li>2.2. Use of symbols.</li> <li>2.2. Evacuation instructions with pictures and words</li> <li>2.3. Planning of floor layout of workplace.</li> <li>2.4. Elimination of hazardous condition.</li> <li>2.5. Use of PPE.</li> </ol>
3. Underpinning skill.	<ol style="list-style-type: none"> <li>3.1. Use of appropriate PPE.</li> <li>3.2. Preparation of signs and banners.</li> <li>3.4. Displaying of signs and banners.</li> </ol>
4. Required attitude.	<ol style="list-style-type: none"> <li>4.1. Commitment to occupational safety and health.</li> <li>4.2. Promptness in carrying out activities.</li> <li>4.3. Tidiness and timeliness.</li> <li>4.4. Respect for rights of peers, sub-ordinates and seniors in workplace.</li> <li>4.5. Sincere and honest to the duties.</li> <li>4.6. Eagerness to learn.</li> <li>4.7. Communication with peers, sub-ordinates and seniors in the workplace.</li> </ol>
5. Resource implication.	<p>The following resources must be provided.</p> <ol style="list-style-type: none"> <li>5.1. Drawing paper.</li> <li>5.2. Drawing templates.</li> <li>5.3. First aid kit with required contents.</li> <li>5.4. PPE</li> <li>5.5. Pen, pencil, marker Pen and eraser.</li> <li>5.6. Banners showing OSH practice.</li> </ol>

6. Method of assessment.	6.1. Oral questions. 6.2. Observation. 6.3. Assignment. 6.4. Practical display. 6.5. Written test.
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.

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**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>GNENGPV2003A1: Apply Basic English</b>
<b>Nominal Hours</b>	<b>60 Hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to read, write, speak and communicate in English in the workplace.</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><i>Italicized terms are elaborated in the range of variables</i></b>
1. Recognize the alphabets in English.	1.1. Alphabets in English are recognized. 1.2. Reading and writing words in English are carried out. 1.3. Reading and writing of technical terms are performed..
2. Read and write workplace information in English.	2.1. Reading of safety signals, banners, nameplates are demonstrated. 2.2. Writing <b>visual information</b> is demonstrated. 2.3. <b>Learning aids</b> are used.
3. Introduce yourself in English to others.	3.1. Introductory conversation in English is demonstrated. 3.2. Self introduction to other in English is performed. 3.3. Reading and writing of nameplates on equipment, materials in the workplace are demonstrated. 3.4. Reading English text is performed. 3.5. <b>Vocabulary</b> practice are performed.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b>
1. Learning aids.	The following resources must be provided. 1.1. Books / booklets with pictures with names written in English. 1.2. Work sheets / ID cards. 1.3. Catalogues / Manuals. 1.4. White boards / Marker pens. 1.5. Chalk boards / Chalk. 1.6. OSH information banner. 1.7. Pen / Pencil. 1.8. Flip charts. 1.9. Cassettes player / recorder. 1.10. Cassettes recorded in English conversations. 1.11. Lessons in English conversations. 1.12. TV and monitor. 1.13. Multimedia.
2. Visual information.	Visual aid includes but not limited to. 2.1. Signs. 2.2. Banners. 2.3. Forms. 2.4. Charts. 2.5. Labels. 2.6. Photo graphs captions. 2.7. Catalogues. 2.8. Cartoons. 2.9. News paper. 2.10. Name plate

3. Vocabulary practice.	Vocabulary practices include but not limited to. 3.1. Conversation in English between two learners. 3.2. Group conversation. 3.3. Reading. 3.4. Singing. 3.5. Listening and reproducing.
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency.	1.1. Reading and writing words in English are carried out. 1.2. Reading and writing of technical terms are performed.
2. Underpinning knowledge.	2.1. Reading of alphabets in English. 2.2. Pronunciation of English words. 2.3. Reading workplace information in English. 2.4. Reading words and sentences in English. 2.5. Structures of words and sentences in English. 2.6. Reading of words in English related to occupation.
3. Underpinning skill.	3.1. Writing of alphabets in English. 3.2. Writing words and sentences in English. 3.3. Writing workplace information in English. 3.4. Writing words and sentences in English related to occupation.
4. Required attitude.	4.1. Communication with peers, sub-ordinates and seniors in the workplace. 4.2. Commitment to occupational safety and health. 4.3. Promptness in carrying out activities. 4.4. Tidiness and timeliness. 4.5. Respect for rights of peers, sub-ordinate and seniors in workplace. 4.6. Sincere and honest to the duties. 4.7. Eagerness to learn.
5. Resource implication.	The learning aids and other required materials must be provided to learn English.
6. Methods of assessment.	Method of assessment includes but not limited to. 6.1. Continuous assessment. 6.2. Oral questions. 6.3. Assignment. 6.4. Written test. 6.5. Reading test 6.6. Speaking test.
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
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Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>GNBANPV2004A1: Apply Basic Bangla</b>
<b>Nominal Hours</b>	<b>60 Hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to read, write, speak and communicate in Bangla in the workplace.</b>
<b>Elements of Competency</b>	<b>Performance Criteria <i>Italicized</i> terms are elaborated in the range of variables</b>
1. Recognize the alphabets in Bangla.	1.1. Alphabets in Bangla are recognized. 1.2. Reading and writing words in Bangla are carried out. 1.3. Reading and writing of technical terms are performed.
2. Read and write workplace information in Bangla.	2.1. Reading of safety signals, banners, nameplates are demonstrated. 2.2. Writing of <b><i>visual information</i></b> are demonstrated. 2.3 <b><i>Learning aids</i></b> are used.
3. Introduce yourself in Bangla to others.	3.1. Self introduction to others in Bangla is performed. 3.2. Reading and writing of nameplates on equipment, materials in the workplace are demonstrated. 3.3. Reading Bangla text is performed. 3.4. <b><i>Vocabulary</i></b> practices are performed.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b>
1. Learning aids.	The following resources must be provided. 1.1. Books / booklets with pictures with names written in Bangla. 1.2. Work sheets / ID cards. 1.3. Catalogues / Manuals. 1.4. White boards / Marker pens. 1.5. Chalk boards / Chalk. 1.6. OSH information banner. 1.7. Pen/ Pencil. 1.8. Flip charts. 1.9. Cassettes player / recorder. 1.10. Cassettes recorded in Bangla conversations. 1.11. Lessons in Bangla conversations. 1.12. TV and monitor. 1.13. Multimedia.
2. Visual information.	Visual information includes but not limited to. 2.1. Banner. 2.2. Form. 2.3. Charte. 2.4. Label. 2.5. Photo graphs captions. 2.6. Catalogues. 2.7. News papers.

3. Vocabulary practice.	Vocabulary practices include but not limited to. 3.1. Conversation in Bangla between two learners. 3.2. Conversation In Bangla in groups. 3.3. Reading 3.4. Singing in Bangla. 3.5. Listening and reproducing.
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency	1.1. Reading and writing words in Bangla are carried out. 1.2. Reading and writing of technical terms are performed.
2. Underpinning knowledge.	2.1. Reading of alphabets in bangla. 2.2. Pronunciation of Bangla words. 2.3. Reading workplace information in Bangla. 2.4. Reading words and sentences in Bangla. 2.5. Structures of words and sentences in Bangla. 2.6. Reading of words in Bangla related to occupation.
3. Underpinning skill.	3.1. Writing of alphabets in Bangla. 3.2. Writing words and sentences in Bangla. 3.3. Writing workplace information in Bangla. 3.4. Writing words and sentences in Bangla related to occupation.
4. Required attitude.	4.1. Communication with peers, sub-ordinates and seniors in workplace. 4.2. Commitment to occupational safety and health. 4.3. Promptness in carrying out activities. 4.4. Tidiness and timeliness. 4.5. Respect for rights of peers, sub-ordinates and seniors in workplace. 4.6. Sincere and honest to the duties. 4.7. Eagerness to learn.
5. Resource implication.	5.1. The learning aids and other required materials must be provided to learn Bangla.
6. Methods of assessment.	Methods of assessment includes but not limited to. 6.1. Continuous assessment. 6.2. Oral questions. 6.3. Assignment. 6.4. Written test. 6.5. Reading test 6.6. Speaking test.

7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
<p><b>Accreditation Requirements</b></p> <p>Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.</p> <p>Accredited providers assessing against this unit of competency must meet the quality assurance requirement set by BTEB.</p>	



# **SECTOR SPECIFIC UNITS**

## **Pre-voc 2**

**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>RACSSPV2005A1: Use hand tools, equipment and materials for servicing of refrigerator and freezer in the workplace.</b>
<b>Nominal Hours</b>	<b>30 hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to select a range of hand tools, equipment and materials for servicing of refrigerator, freezer in the servicing workplace.</b>
<b>Elements of Competency</b>	<b>Performance Criteria <i>Italicized terms are elaborated in the range of variables</i></b>
1. Use hand tools.	1.1. <b><i>PPE and OSH material</i></b> used during working as per instruction. 1.2. Importance of using <b><i>hand tools</i></b> is recognized. 1.3. List of hand tools is prepared. 1.4. Hand tools are collected for the <b><i>task</i></b> . 1.5. Unsafe or defective hand tools are separated. 1.6. Safe work practices are followed using hand tools.
2. Use power tools.	2.1. Use of <b><i>power tools</i></b> is recognized. 2.2. Power tools in workplace are collected. 2.3. Proper power tools are used to proper task. 2.4. <b><i>Safe work practices</i></b> are followed using power tools. 2.5. Source of power supply for power tools is ensured. 2.6. Power tools are disconnected from power source.
3. Use equipment,	3.1. List of equipment with specification is prepared. 3.2. <b><i>Equipment</i></b> for servicing RAC unit are collected and used.
4. Collect materials	4.1. List of material with specification is prepared. 4.2. <b><i>Materials</i></b> for servicing RAC unit are collected and used.
5. Perform maintenance of the tools.	5.1. Routine maintenance of hand and power tools is undertaken according to standard operating procedure. 5.2. <b><i>Cleaning and lubricating agent</i></b> for tools are used. 5.3. Defective tools are identified and collected. 5.4. Tools are cleaned. 5.5. Defective tools are repaired / replaced as required. 5.6. Lubricating agents is applied as required. 5.7. Workplace is cleaned. 5.8. Tools are stored in designated location in accordance with workplace practice.

<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b>
1. Hand Tools	<p>Hand tools may include but not limited to:</p> <ol style="list-style-type: none"> <li>1.1. Hammer.</li> <li>1.2. Mallet.</li> <li>1.3. Combination pliers.</li> <li>1.4. Adjustable wrenches.</li> <li>1.5. Circlip pliers.</li> <li>1.6. Diagonal cutting pliers.</li> <li>1.7. Allen key.</li> <li>1.8. Hacksaw frame.</li> <li>1.9. Scissors.</li> <li>1.10. Crimping pliers.</li> <li>1.11. Neon tester.</li> <li>1.12. Screw driver(Flat and Philips head).</li> <li>1.13. Socket wrench set.</li> <li>1.14. Filler gauge.</li> <li>1.15. Bearing puller.</li> <li>1.16. Vernier calipers.</li> <li>1.17. Files.</li> <li>1.18. Spirit level.</li> <li>1.19. Reamer.</li> <li>1.20. Chisel.</li> <li>1.21. Vices.</li> <li>1.22. Tube bender.</li> <li>1.23. Flaring and swaging tools.</li> <li>1.24. Tube cutter.</li> </ol>
2. Power tools	<p>Power tools may include but not limited to:</p> <ol style="list-style-type: none"> <li>2.1. Electric hand drill machine.</li> <li>2.2. De-soldering pump.</li> <li>2.3. Soldering iron.</li> <li>2.4. Bench grinders.</li> <li>2.5. Bench drill machine.</li> <li>2.6. Vacuum cleaner.</li> <li>2.7. Air blower.</li> <li>2.8. Pedestal grinders.</li> <li>2.9. Electric hand grinder.</li> <li>2.10. High vacuum pump.</li> </ol>
3. Equipment.	<p>Equipment may include but not limited to:</p> <ol style="list-style-type: none"> <li>3.1. Pressure gauge.</li> <li>3.2. Multi meter.</li> <li>3.3. AMP meter etc.</li> <li>3.4. Oxy-acetylene gas set</li> <li>3.5. Single cylinder/Gas welding set.</li> </ol>
4. Materials	<p>Materials may include but not limited to:</p> <ol style="list-style-type: none"> <li>4.1. Refrigerant-12/22/134a/600a/404a/407c/HC blend</li> <li>4.2. Refrigeration fittings</li> <li>4.3. Charging hoses</li> </ol>

	<ul style="list-style-type: none"> <li>4.4. Capillary tube (pipe)</li> <li>4.5. Welding and soldering materials</li> <li>4.6. Gaskets</li> <li>4.7. Emery cloth and water proof emery paper</li> <li>4.8. Hacksaw blade</li> <li>4.9. Leak testing and flushing material</li> </ul>
5. PPE	<p>PPE may include but not limited to:</p> <ul style="list-style-type: none"> <li>5.1. Mask;</li> <li>5.2. Aprons.</li> <li>5.3. Safety goggles</li> <li>5.4. Gloves.</li> <li>5.5. Safety shoes.</li> <li>5.6. Helmet.</li> <li>5.7. Safety belt set.</li> </ul>
6.Safe work practices.	<p>Safe work practices may include but not limited to:</p> <ul style="list-style-type: none"> <li>6.1. Working using personal protective equipment.</li> <li>6.2. Ensure proper ventilation in the workplace.</li> <li>6.3. Elimination of hazards at workplace.</li> </ul>
7. Cleaning and lubricating agent	<p>Cleaning and lubricating agent may include but not limited to:</p> <ul style="list-style-type: none"> <li>6.1. Hand polishing,</li> <li>6.2. Emery cloth</li> <li>6.3. Mobil.</li> <li>6.4. Grease</li> <li>6.5. Kerosene</li> <li>6.6. Cleaning jute.</li> </ul>
<p><b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the unit of competency.</p>	
1. Critical aspect of competency.	<ul style="list-style-type: none"> <li>1.1. Use of hand and power tools for RAC servicing.</li> <li>1.2. Servicing of RAC unit.</li> </ul>
2. Underpinning knowledge.	<ul style="list-style-type: none"> <li>2.1. Identification of proper hand tools.</li> <li>2.2. identify and use of materials.</li> <li>2.3. Interpretation of refrigeration principle.</li> <li>2.4. Working principle of RAC unit.</li> </ul>
3. Underpinning skill.	<ul style="list-style-type: none"> <li>3.1. Using hand tools.</li> <li>3.2. Using materials.</li> <li>3.3. Using equipment.</li> <li>3.4. Repairing and replacing of RAC units.</li> </ul>
4. Required attitude.	<ul style="list-style-type: none"> <li>4.1. Communication with peers, sub-ordinates and seniors in workplace.</li> <li>4.2. Commitment to occupational safety and health.</li> <li>4.3. Promptness in carrying out activities.</li> <li>4.4. Tidiness and timeliness.</li> <li>4.5. Respect for rights of peers, sub-ordinates and seniors in workplace.</li> </ul>

	4.6. Sincere and honest to the duties. 4.7. Eagerness to learn.
5. Resource implication.	The following resources must be provided. 1.1. Hand tools. 1.2. Power tools. 1.3. Materials. 1.4. Refrigerator. 1.5. Window air cooler. 1.6. Charging equipment. 1.7. Refrigerant.
6. Methods of assessment.	Methods of assessment includes but not limited to. 6.1. Continuous assessment. 6.2. Oral questions. 6.3. Assignment. 6.4. Written test. 6.5. Observation.
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
<p><b>Accreditation Requirements</b>  Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.  Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.</p>	

# **OCCUPATIONAL SPECIFIC UNITS**

## **Pre-voc 2**

**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>RACOSPV2006A1: Demonstrate the operation of mechanical refrigeration cycle.</b>
<b>Nominal Hours</b>	<b>40 hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to demonstrate the operation of mechanical refrigeration cycle in the workplace.</b>
<b>Element of Competency</b>	<b>Performance Criteria <i>Italicized terms are elaborated in the range of variables</i></b>
1. Prepare the mechanical refrigeration demonstrating unit.	1.1. Safe work practices followed and Personal Protective Equipment ( <b><i>PPE</i></b> ) are used. 1.2. <b><i>Hazards</i></b> at workplace is eliminated. 1.3. A mechanical refrigeration unit is collected. 1.3. Power supply of the mechanical refrigeration unit is turned off. 1.4. The refrigeration unit is cleaned.
2. Identify the components of the refrigeration cycle.	2.1. The components of refrigeration cycle is identified on drawing. 2.2. The components of refrigeration cycle is identified on the unit.
3. Start the refrigeration unit.	3.1. Clamp-on-ammeter is set on the line. 3.2. The switch of the power supply is turned on. 3.3. The discharge and suction line temperature is observed. 3.4. The suction and discharged pressure of the demonstration unit is recorded. 3.5. The temperature of the evaporator and condenser are observed. 3.6. The operation of the cycle is explained.
4. Exercise the terminologies related to refrigeration cycle.	4.1. Heat, temperature and pressure effect are explained. 4.2. Creating low pressure in the evaporator and high pressure in the condenser are discussed. 4.3. Units of pressure and temperature are noted.
5. Store the tools and equipment and clean the workplace.	5.1. Tools and equipment are cleaned and stored. 5.2. The workplace is cleaned as per workplace standard.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (May include but not limited to☺)</b>
1. Hand tools.	1.1. Adjustable wrench. 1.2. Service valve wrench. 1.3. Neon tester.
2. Equipment.	2.1. Pressure gauge.

	<ul style="list-style-type: none"> <li>2.2. Clamp-on-ampere meter.</li> <li>2.3. Dust blower.</li> </ul>
3. Materials.	<ul style="list-style-type: none"> <li>3.1. Charging hose.</li> <li>3.2. Waste cotton.</li> </ul>
4. PPE	<ul style="list-style-type: none"> <li>1.1. Apron.</li> <li>1.2. Hand gloves.</li> <li>1.3. Cleaning agents.</li> <li>1.4. Musk.</li> <li>1.5. Safety goggles.</li> <li>1.5. Safety shoes.</li> <li>1.6. First aid box.</li> </ul>
2. Hazard.	<p>Hazard may include but not limited to:</p> <ul style="list-style-type: none"> <li>2.1. Accumulation of waste materials.</li> <li>2.2. Random storage of tools, equipment and furniture.</li> <li>2.3. Storage of rejected wires, cables and structural materials.</li> <li>2.4. Storage of flammable materials.</li> <li>2.5. Congested emergency exit.</li> <li>2.6. Oil split floor at workplace.</li> </ul>
<p><b>Evidence Guide</b>  The evidence must be authentic, valid, sufficient, reliable, consistent , recent and meet the requirements of the current version of the Unit of Competency.</p>	
1.Critical aspects of competency.	<ul style="list-style-type: none"> <li>1.1. Use of hand tools and power tools.</li> <li>1.2. Cleaning and operation of RAC unit.</li> </ul>
2.Required underpinning knowledge.	<ul style="list-style-type: none"> <li>2.1. Heat, temperature and pressure.</li> <li>2.2. Refrigerant.</li> <li>2.3. Function of each components of refrigeration cycle.</li> <li>2.4. Construction of compressor.</li> </ul>
3.Required underpinning skills.	<ul style="list-style-type: none"> <li>3.1. Starting system of refrigeration unit.</li> <li>3.2. Measuring ampere with clamp-on-ampere meter.</li> <li>3.3. Identification of each components.</li> </ul>
4.Required underpinning Attitude.	<ul style="list-style-type: none"> <li>4.1. Commitment to occupational safety and health.</li> <li>4.2. Communication with peers, sub-ordinates and seniors in workplace.</li> <li>4.3. Promptness in carrying out activities.</li> <li>4.4. Tidiness and timeliness.</li> <li>4.5. Respect of peers, sub-ordinates and seniors in workplace.</li> <li>4.6. Environmental concern.</li> <li>4.7. Sincere and honest to duties.</li> </ul>
5.Resource implication.	<p>The following resources must be provided.</p> <ul style="list-style-type: none"> <li>5.1. Hand tools and electrical meters.</li> <li>5.2. Wall poster of refrigeration cycle.</li> <li>5.3. Model/ demonstrating unit.</li> </ul>



	5.4. PPE. 5.5. First aid box with required contents.
6. Method of assessment.	6.1. Oral questions. 6.2. Demonstration. 6.3. Written test.
7. Context of assessment.	Competencies may be assessed in the work place or in a simulated work place

**Accreditation Requirements**

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre-voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>RACOSPV2007A1: Demonstrate domestic refrigerator and deep freezer.</b>
<b>Nominal Hours</b>	<b>40 hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to demonstrate the domestic refrigerator and deep freezer in the workplace.</b>
<b>Element of Competency</b>	<b>Performance Criteria <i>Italicized terms are elaborated in the range of variables</i></b>
1. Select components.	1.1. Safe work practices followed and Personal Protective Equipment ( <b>PPE</b> ) are used. 1.2. <b>Hazards</b> at workplace is eliminated. 1.3. <b>Hand tools, power tools</b> and materials are collected according to job requirement. 1.4. Names of components are documented. 1.5. <b>Components of domestic refrigerator</b> are introduced. 1.6. Components of deep freezer are introduced. 1.7. The refrigerator and the deep freezer checked visually. 1.8. Components of the refrigerator cabinet are identified.
2. Recognize the function of the components of refrigerator cabinet and refrigeration cycle.	2.1. The <b>function</b> and use of domestic refrigerator and deep freezer are recognized. 2.2. The function of the components of refrigerator are explained. 2.3. The function of the components of deep freezer are explained. 2.4. The components of refrigerator cabinet are demonstrated.
3. Install the refrigerator and deep freezer.	3.1. Measuring tools and fixing materials are collected for installation of refrigerator and deep freezer. 3.2. Location of refrigerator and deep freezer are selected as per instruction manuals. 3.3. The refrigerator and the deep freezer are installed.
4. Clean and store the equipment.	4.1. Equipment is cleaned and stored. 4.2. Workplace is cleaned as per workplace standards.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (May include but not limited to:)</b>
1. PPE	1.1. Apron. 1.2. Hand gloves. 1.3. Cleaning agents. 1.4. Musk. 1.5. Safety shoes. 1.6. First aid box.
2. Hand tools	2.1. Combination pliers. 2.2. Nose pliers.

	<ul style="list-style-type: none"> <li>2.3. Crimping pliers.</li> <li>2.4. Cutting pliers.</li> <li>2.5. Knife.</li> <li>2.6. Screw driver (Flat and Philips head).</li> <li>2.7. Slide wrench.</li> <li>2.8. Socket wrench set.</li> <li>2.9. Neon tester.</li> <li>2.10. Hammer.</li> <li>2.11. Mallet.</li> <li>2.12. Tube bender.</li> <li>2.13. Tube cutter.</li> <li>2.14. Flaring and swaging tools</li> <li>2.15. Reamer.</li> <li>2.16. Combination pressure gauge.</li> </ul>
3. Domestic refrigerator.	<ul style="list-style-type: none"> <li>3.1. One door type refrigerator.</li> <li>3.2. Two door type refrigerator.</li> <li>3.3. One chamber type refrigerator.</li> <li>3.4. Two chambers type refrigerator.</li> <li>3.5. Frost type refrigerator.</li> <li>3.6. Defrost type of refrigerator.</li> <li>3.7. No frost type refrigerator.</li> </ul>
4. Components.	<ul style="list-style-type: none"> <li>4.1. Compressor.</li> <li>4.2. Motor starting relay.</li> <li>4.3. Overload protector.</li> <li>4.4. Thermostat switch.</li> <li>4.5. Timer.</li> <li>4.6. Defrost heater.</li> <li>4.7. Capacitor.</li> <li>4.8. Door lamp.</li> <li>4.9. Door switch.</li> <li>4.10. Electrical fuses / thermal fuses.</li> <li>4.11. Lamp holder.</li> <li>4.12. Cabinet lamp.</li> <li>4.13. Cooling fan.</li> <li>4.14. Fan switch.</li> <li>4.16. Switch.</li> <li>4.17. Socket.</li> <li>4.18. Plug.</li> <li>4.19. Cable.</li> </ul>
5. Function	<ul style="list-style-type: none"> <li>5.1. Function of compressor.</li> <li>5.2. Function of condenser.</li> <li>5.3. Function of evaporator.</li> <li>5.4. Function of dryer.</li> <li>5.5. Function of thermostat.</li> <li>5.6. Function of defrost heater.</li> <li>5.7. Function of timer.</li> <li>5.8. Function of starting relay.</li> <li>5.9. Function of capacitor.</li> </ul>

	<ul style="list-style-type: none"> <li>5.10. Function of door switch.</li> <li>5.11. Function electrical fuse.</li> <li>5.12. Function of thermal fuse.</li> <li>5.13. Function of capillary tube</li> <li>5.14. Function of cooling fan.</li> <li>5.15. Function of lamp holder.</li> <li>5.16. Function of gasket.</li> <li>5.17. Function of magnetic strip.</li> <li>5.18. Function of overload protector.</li> <li>5.19. Function of capillary tubes.</li> </ul>
<p><b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent , recent and meet the requirements of the current version of the Unit of Competency.</p>	
1.Critical aspects of competency.	<ul style="list-style-type: none"> <li>1.1. Function of components of domestic refrigerator.</li> <li>1.2. Function of components of deep freezer.</li> </ul>
2.Required underpinning knowledge.	<ul style="list-style-type: none"> <li>2.1. Function of components of domestic refrigerators.</li> <li>2.2. Function of components of deep freezer.</li> <li>2.3.Operation of electrical function of domestic refrigerators</li> <li>2.4.Operation of electrical function of deep freezer.</li> </ul>
3.Required underpinning skills.	<ul style="list-style-type: none"> <li>3.1. Wiring of domestic refrigerator.</li> <li>3.2. Wiring of deep freezer.</li> <li>3.3. Testing electrical components of domestic refrigerator.</li> <li>3.4. Testing electrical components of deep freezer.</li> <li>3.5. Trouble shooting in domestic refrigerator.</li> <li>3.6. Trouble shooting in deep freezer.</li> </ul>
4.Required underpinning Attitude.	<ul style="list-style-type: none"> <li>4.1. Commitment to occupational safety and health.</li> <li>4.2. Communication with peers, sub-ordinates and seniors in workplace.</li> <li>4.3. Promptness in carrying out activities.</li> <li>4.4. Tidiness and timeliness.</li> <li>4.5. Respect of peers, sub-ordinates and seniors in workplace.</li> <li>4.6. Environmental concern.</li> <li>4.7. Sincere and honest to duties.</li> </ul>
5.Resource implication.	<p>The following resources must be provided.</p> <ul style="list-style-type: none"> <li>5.1. Hand tools.</li> <li>5.2. Domestic refrigerator</li> <li>5.3. Deep freezer.</li> <li>5.4. First aid box.</li> <li>5.5. PPE.</li> </ul>
6. Method of assessment.	<p>Competencies must be assessed by:</p> <ul style="list-style-type: none"> <li>6.1. Oral questions</li> <li>6.2. Demonstration</li> <li>6.3. Written test.</li> </ul>
7. Context of assessment.	<p>Competencies may be assessed in the work place or in a</p>

	simulated work place
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**Accreditation Requirements**

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

**National Technical Vocational Qualification Framework (NTVQF) for Bangladesh  
Refrigeration and Air Conditioning: Pre voc 2  
Unit of Competency**

<b>Unit Code and Title</b>	<b>RACOSPV2008A1: Service domestic refrigerator</b>
<b>Nominal Hours</b>	<b>40 hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to service the domestic refrigerator in the workplace.</b>
<b>Element of Competency</b>	<b>Performance Criteria</b> <b><i>Italicized terms are elaborated in the range of variables</i></b>
1. Prepare workplace, tools and equipment.	1.1. Safe work practices followed and Personal Protective Equipment ( <b><i>PPE</i></b> ) are used. 1.2. <b><i>Hazards</i></b> at workplace is eliminated. 1.3. Workplace is prepared for servicing the refrigerator. 1.3. <b><i>Hand tools</i></b> and materials are collected according to job requirement. 1.3. A <b><i>domestic refrigerator</i></b> is collected. 1.4. The domestic refrigerator is checked visually.
2. Service compressor compartment.	2.1. Compressor compartment is checked visually. 2.2. Compressor compartment is cleaned. 2.3. The switch of compressor motor is turned on. 2.4. The operation of compressor motor is observed. 2.5. The switch of compressor motor is turned off. 2.7. Power supply is removed.
3. Service refrigerator cabinet.	3.1. Freezer compartment of refrigerator is checked visually. 3.2. Frosted type refrigerator cabinet is cleaned. 3.3. Non-frosted type refrigerator cabinet is cleaned.

4. Check domestic refrigerator	<p>4.1. All components of the cabinet and mountings are checked visually.</p> <p>4.2. All components of the refrigeration cycle are checked visually.</p> <p>4.3. All electrical components are checked visually.</p> <p>4.5. The refrigerator is started and observed its operation.</p>
7. Clean and store the equipment.	<p>3.1. Equipment is cleaned and stored.</p> <p>3.2. Workplace is cleaned as per workplace standards.</p>
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (May include but not limited to:)</b>
1. PPE	<p>1.1. Apron.</p> <p>1.2. Hand gloves.</p> <p>1.3. Cleaning agents.</p> <p>1.4. Musk.</p> <p>1.5. Safety shoes.</p> <p>1.6. Safety goggles</p> <p>1.6. First aid box.</p>
2. Hand tools	<p>2.1. Combination pliers.</p> <p>2.2. Nose pliers.</p> <p>2.3. Crimping pliers.</p> <p>2.4. Cutting pliers.</p> <p>2.5. Knife.</p> <p>2.6. Screw driver (Flat and Philips head).</p> <p>2.7. Slide wrench.</p> <p>2.8. Socket wrench set.</p> <p>2.9. Neon tester.</p> <p>2.10. Hammer.</p> <p>2.11. Mallet.</p> <p>2.12. Tube bender.</p> <p>2.13. Tube cutter.</p> <p>2.14. Flaring and swaging tools</p> <p>2.15. Reamer.</p> <p>2.16. Combination pressure gauge.</p>
3. Domestic refrigerator.	<p>3.1. One door type refrigerator.</p> <p>3.2. Two door type refrigerator.</p> <p>3.3. One chamber type refrigerator.</p> <p>3.4. Two chambers type refrigerator.</p> <p>3.5. Frost type refrigerator.</p> <p>3.6. Defrost type of refrigerator.</p> <p>3.7. No frost type refrigerator.</p>
4. Components.	<p>4.1. Door exterior liner.</p> <p>4.2. Door interior liner</p> <p>4.3. Door seal.</p> <p>4.4. Door insulation.</p> <p>4.5. Door hinge.</p> <p>4.6. Door bottle guard.</p> <p>4.7. Door egg guard.</p>

	<p>4.8. Compressor compartment  4.9. Compressor mounting.  4.10. Compressor.  4.11. Motor starting relay.  4.12. Overload protector.  4.13. Thermostat switch.  4.14. Timer.  4.15. Defrost heater.  4.16. Capacitor.  4.17. Door lamp.  4.18. Door switch.  4.19. Electrical fuses / thermal fuses.  4.20. Lamp holder.  4.21. Cabinet lamp.  4.22. Cooling fan and fan mounting.  4.23. Fan switch.  4.24. Switch.  4.25. Socket.  4.26. Plug.  4.27. Cable.</p>
5. Function	<p>5.1. Function of compressor.  5.2. Function of condenser.  5.3. Function of evaporator.  5.4. Function of dryer.  5.5. Function of thermostat.  5.6. Function of defrost heater.  5.7. Function of timer.  5.8. Function of starting relay.  5.9. Function of capacitor.  5.10. Function of door switch.  5.11. Function electrical fuse.  5.12. Function of thermal fuse.  5.13. Function of capillary tube  5.14. Function of cooling fan.  5.15. Function of lamp holder.  5.16. Function of gasket.  5.17. Function of magnetic strip.  5.18. Function of overload protector.  5.19. Function of capillary tubes.</p>
2. Hazard.	<p>Hazard may include but not limited to:  2.1. Accumulation of waste materials.  2.2. Random storage of tools, equipment and furniture.  2.3. Storage of rejected wires, cables and structural materials.  2.4. Storage of flammable materials.  2.5. Congested emergency exit.  2.6. Oil split floor at workplace.</p>

<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent , recent and meet the requirements of the current version of the Unit of Competency.	
1.Critical aspects of competency.	1.1. Function of components of domestic refrigerator. 1.2. Supplied power is in compliance with nameplate ratings. 1.3. Perform tasks in accordance with standard operating procedure. 1.4. Using techniques and practice as per workplace procedures.
2.Required underpinning knowledge.	2.1. Function of components of domestic refrigerators. 2.2. Types of tools and equipment used in servicing. 2.3.Operation of electrical function of domestic refrigerators 2.4.Chemical used for cleaning refrigerator cabinet. 2.5. Different types of refrigerators. 2.6. Procedure of starting equipment.
3.Required underpinning skills.	3.1. Wiring of domestic refrigerator. 3.2. Method of using tools and materials. 3.3. Testing electrical components of domestic refrigerator. 3.4. Cleaning interior components of refrigerator. 3.5. Trouble shooting in domestic refrigerator. 3.6. Starting of refrigerator. 3.7. Use of PPE.
4.Required underpinning Attitude.	4.1. Commitment to occupational safety and health. 4.2. Communication with peers, sub-ordinates and seniors in workplace. 4.3. Promptness in carrying out activities. 4.4. Tidiness and timeliness. 4.5. Respect of peers, sub-ordinates and seniors in workplace. 4.6. Environmental concern. 4.7. Sincere and honest to duties.
5.Resource implication.	The following resources must be provided. 5.1. Hand tools. 5.2. Domestic refrigerator. 5.3. Air blower. 5.4. First aid box. 5.5. PPE. 5.6. Manufacturers cleaning and servicing instruction.
6. Method of assessment.	Competencies must be assessed by: 6.1. Oral questions 6.2. Demonstration 6.3. Written test.
7. Context of assessment.	Competencies may be assessed in the work place or in a simulated work place



**Accreditation Requirements**

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

**Refrigeration and Air Conditioning: NTVQF 1  
Unit of Competency**

<b>Unit Code and Title</b>	<b>RACOSPV2009A1: Service deep freezer.</b>
<b>Nominal Hours</b>	<b>30 hours</b>
<b>Unit Descriptor</b>	<b>This unit of competency requires the knowledge, skills and attitude to perform servicing of deep freezer at the workplace as per required workplace standards.</b>
<b>Element of Competency</b>	<b>Performance Criteria</b> <b><i>Italicized terms are elaborated in the range of variables</i></b>
1. Prepare workplace, tools and equipment.	1.1. Safe work practices followed and Personal Protective Equipment ( <b><i>PPE</i></b> ) are used. 1.2. <b><i>Hazards</i></b> at workplace is eliminated. 1.3. Workplace is prepared for servicing the deep freezer. 1.3. <b><i>Hand tools, equipment</i></b> and <b><i>materials</i></b> are collected according to job requirement. 1.3. A deep freezer is collected. 1.4. The deep freezer is checked visually.
2. Service compressor compartment.	2.1. Compressor compartment is checked visually. 2.2. Compressor compartment is cleaned. 2.3. The switch of compressor motor is turned on. 2.4. The operation of compressor motor is observed. 2.5. The switch of compressor motor is turned off. 2.7. Power supply is removed.
3. Service freezer cabinet.	3.1. Compartment of deep freezer is checked visually. 3.2. Frosted type deep freezer cabinet is cleaned. 3.3. Non-frosted type deep freezer cabinet is cleaned.
4. Check deep freezer.	4.1. All <b><i>components</i></b> of the cabinet and mountings are checked visually. 4.2. All components of the refrigeration cycle are checked visually. 4.3. All electrical components are checked visually. 4.5. The refrigerator is started and observed its operation.
5. Clean and store the tools and equipment.	5.1. Tools and equipment are cleaned and stored. 5.2. Workplace is cleaned as per workplace standards.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (May include but not limited to:)</b>
1. PPE.	1.1. Apron, 1.2. Goggles, 1.3. Hand gloves, 1.4. Cleaning agents, 1.5. Protective shoes, 1.6. Floor brush, 1.7. Frst aid box.

2. Hazard.	Hazard may include but not limited to: 2.1. Accumulation of waste materials. 2.2. Random storage of tools, equipment and furniture. 2.3. Storage of rejected wires, cables and structural materials. 2.4. Storage of flammable materials. 2.5. Congested emergency exit. 2.6. Oil split floor at workplace.
2. Hand tools.	2.1. Combination pliers. 2.2. Cutting pliers. 2.3. Nose pliers. 2.4. Screw driver (Flat blade and Philips head). 2.5. Allen key. 2.6. Crimping pliers. 2.7. Neon tester. 2.8. Socket wrench set (Metric system). 2.9. Reamer. 2.10. Tube bender. 2.11. Flaring and swaging tools. 2.12. Tube cutter. 2.13. Mallet.
3. Equipment.	3.1. Pressure gauge. 3.2. Thermometer. 3.3. Clamp-on-Avo meter. 3.4. Compressor 3.5. Pump 3.6. Electric hand drill machine
4. Components.	4.1. Evaporator 4.2. Condenser 4.3. Dryer 4.4. Saring relay 4.5. Thermostate 4.6. Door lamp 4.7. Door switch 4.8. Temperatue control knob
5. Materials.	5.1. Cleaning materials, 5.2. Duster cloth, 5.3. Detergent, 5.4. Red oxide, 5.5. Screw, 5.6. Refrigerent gas
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspect of competency	1.1. Function of components of deep freezer. 1.2. Supplied power is in compliance with nameplate

	<p>ratings.</p> <p>1.3. Perform tasks in accordance with standard operating procedure.</p> <p>1.4. Using techniques and practice as per workplace procedures.</p> <p>1.5. Cleaning of refrigerator body and drain pipe.</p>
2. Underpinning knowledge.	<p>2.1. Function of components of deep freezer.</p> <p>2.2. Types of tools and equipment used in servicing.</p> <p>2.3. Different types of deep freezer.</p> <p>2.4. Knowledge about pressure gauge.</p>
3. Underpinning skill.	<p>3.1. Use of the tools and equipment.</p> <p>3.2. Cleaning interior components of deep freezer.</p> <p>3.3. Starting the deep freezer.</p> <p>3.4. Use of PPE</p>
4. Required attitude.	<p>4.1. Communication with peers, sub-ordinates and seniors in workplace.</p> <p>4.2. Commitment to occupational safety and health.</p> <p>4.3. Promptness in carrying out activities.</p> <p>4.4. Tidiness and timeliness.</p> <p>4.5. Respect of peers, sub-ordinates and seniors in workplace.</p> <p>4.6. Sincere and honest to the duties.</p> <p>4.7. Eagerness to learn.</p>
5. Resource implication.	<p>The following resources must be provided.</p> <p>5.1. Hand tools.</p> <p>5.2. Unit of deep freezer.</p> <p>5.3. Combination pressure gauge.</p> <p>5.4. Gas welding set with accessories and materials.</p> <p>5.5. Clamp-on-AVO meter.</p> <p>5.6. Refrigerant and compressor oil.</p> <p>5.7. Cleaning chemicals and materials.</p> <p>5.8. Air blower.</p>
6. Methods of assessment.	<p>Methods of assessment includes but not limited to.</p> <p>6.1. Demonstration.</p> <p>6.2. Oral questions.</p> <p>6.3. Written test.</p>
7. Context of assessment.	<p>Competency may be assessed in the workplace or in a simulated workplace.</p>
<p><b>Accreditation Requirements</b></p> <p>Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.</p> <p>Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.</p>	

