

Trade Profile

Refrigeration and Air Conditioning Mechanic



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Red Seal Trade Profile

Refrigeration and Air Conditioning Mechanic



Structure of the Trade Profile

This profile has two sections that provide a snapshot of the trade's description, and all trade activities as they are organized in the Red Seal Occupational Standard:

Description of the Refrigeration and Air Conditioning Mechanic trade: an overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this trade

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities

Task: distinct actions that describe the activities within a major work activity

Sub-task: distinct actions that describe the activities within a task

A complete version of the occupational standard, which provides additional detail for the trade activities, skills and knowledge can be found at www.red-seal.ca.

Description of the Refrigeration and Air Conditioning Mechanic Trade

“Refrigeration and Air Conditioning Mechanic” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by refrigeration and air conditioning mechanics.

Refrigeration and air conditioning mechanics install, maintain, service and retrofit residential, commercial, industrial and institutional heating, ventilation, air conditioning and refrigeration units and systems. They also connect to and service air delivery systems, install and service hydronic and secondary refrigerant systems and associated controls. They install, repair and maintain systems for climate control and air quality. Their duties include laying out reference points for installation, assembling and installing components, installing wiring and cabling, to connect components and equipment to an electric power supply and calibrating related controls. They also measure, cut, bend, thread and connect piping and tubing to functional components and utilities.

Refrigeration and air conditioning mechanics maintain and service systems by inspecting and testing system and electrical components, and brazing, soldering and connecting mechanical fittings during installation or repairs. As part of service and commissioning, refrigeration and air conditioning mechanics start up, test, charge, adjust, calibrate, balance, measure, verify, maintain and document systems. They retrofit equipment with new energy efficient heating, ventilation, air conditioning and refrigeration (HVAC/R) systems using advanced electronic controls. They also retrofit HVAC/R systems with newer refrigerants and refrigerant oils.

In addition to their regular duties, some refrigeration and air conditioning mechanics may also prepare work estimates, source and order parts and materials, and design systems for clients.

Refrigeration and air conditioning mechanics work with a range of tools and equipment including hand, power, measuring, hoisting and rigging, charging, recovery, electrical and diagnostic.

They may be employed by HVAC/R contractors and manufacturers, property owners, retail establishments, and institutional and public sector employers. They also may be self-employed. Refrigeration and air conditioning mechanics may work on systems and units in housing, office buildings, restaurants, food and beverage, processing plants, ice rinks and arenas, supermarkets, hospitals, marine, aviation and mining sectors as well as bio-medical, scientific, research and development fields. They may also work on refrigerated transport trucks and trailers, automotive air conditioning systems, railcars and appliances.

In some jurisdictions, refrigeration and air conditioning mechanics may be required to work on fuel-fired equipment and therefore may require additional licencing.

Refrigeration and air conditioning mechanics work in various locations such as residential, industrial, commercial and institutional spaces, rooftops, mechanical rooms, computer rooms and laboratories. The work may be performed indoors or outdoors year-round and may require extensive travelling. Much of the work is performed independently.

Inherent risks in this trade include working at heights and in confined spaces, working with compressed gases, flammable and hazardous materials, chemicals and electricity. Hazardous work environments and weather conditions are also factors. Refrigeration and air conditioning mechanics must be aware of the physical demands and potential for personal injury when performing tasks.

People entering this trade should have key attributes such as strong client service, writing, communication and problem-solving skills, attention to detail, and the ability to be independent and self-directed. Coordination and manual dexterity are also important, as are mechanical and mathematical abilities. Good physical condition and the strength to lift heavy components are also valuable.

This standard recognizes some similarities with the work of steamfitters/pipefitters, plumbers, gasfitters, oil heat system technicians, sheet metal workers, industrial mechanics (millwrights), electricians, instrumentation and control technicians, riggers and stationary engineers.

With experience, refrigeration and air conditioning mechanics may act as mentors and trainers of apprentices in the trade. They may also become specialized in one area of the trade, advance to supervisory positions or become trainers.

Refrigeration and Air Conditioning Mechanic

Task Matrix

A – Performs common occupational skills

8%

Task A-1 Maintains safe and healthy workplace 81%	A-1.01 Maintains safe work environment	A-1.02 Performs lock-out, tag-out and isolation procedures	A-1.03 Uses personal protective equipment (PPE) and safety equipment
	A-1.04 Participates in healthy and respectful work environment		
Task A-2 Maintains continuous learning 13%	A-2.01 Upskills in new trade practices and procedures	A-2.02 Upskills in emerging technologies	
Task A-3 Uses communication and mentoring techniques 6%	A-3.01 Uses communication techniques	A-3.02 Uses mentoring techniques	

B – Performs routine trade activities

16%

Task B-4 Uses tools and equipment 24%	B-4.01 Uses hand tools	B-4.02 Uses portable and stationary power tools	B-4.03 Uses piping and tubing connecting tools and equipment
	B-4.04 Uses recovery, recycling and charging tools and equipment	B-4.05 Uses evacuation tools and equipment	B-4.06 Uses diagnostic and measuring tools and equipment
	B-4.07 Uses electrical tools and equipment	B-4.08 Uses access equipment	B-4.09 Uses rigging, hoisting and lifting equipment
	B-4.10 Uses digital technology		
Task B-5 Organizes work 21%	B-5.01 Interprets drawings and specifications	B-5.02 Uses reference material and documentation	B-5.03 Plans job tasks and procedures
Task B-6 Performs work site preparation 19%	B-6.01 Prepares work site	B-6.02 Handles materials and supplies	
Task B-7 Performs trade-specific activities 36%	B-7.01 Connects piping and tubing	B-7.02 Performs leak and pressure tests on systems	B-7.03 Evacuates systems
	B-7.04 Uses refrigerants, gases and oils	B-7.05 Performs field wiring of systems	B-7.06 Applies sealants, adhesives and insulation

C – Plans installation

13%

Task C-8 Plans installation of standard and high efficiency HVAC/R systems 34%	C-8.01 Performs HVAC/R system design	C-8.02 Selects HVAC/R equipment, components and accessories	C-8.03 Determines placement of HVAC/R equipment, components and accessories
	C-8.04 Performs HVAC/R material take-off		
Task C-9 Plans installation of control systems 28%	C-9.01 Performs control system design	C-9.02 Selects control system components and accessories	C-9.03 Determines placement of control system components and accessories
	C-9.04 Performs control system material take-off		
Task C-10 Plans retrofits 38%	C-10.01 Analyzes energy efficiency of current system	C-10.02 Determines requirements for retrofits	C-10.03 Analyzes distribution requirements for retrofits
	C-10.04 Performs design and sizing of retrofit equipment and components	C-10.05 Plans retrofit of control systems	

D – Performs installation

21%

Task D-11 Installs HVAC/R systems 63%	D-11.01 Confirms system layout	D-11.02 Assembles HVAC/R equipment, components and accessories	D-11.03 Places HVAC/R equipment, components and accessories
	D-11.04 Retrofits HVAC/R equipment refrigerants and refrigerant oils	D-11.05 Retrofits HVAC/R equipment, components and accessories	D-11.06 Installs fasteners, brackets and hangers
	D-11.07 Installs HVAC/R piping and tubing	D-11.08 Applies HVAC/R holding charge	
Task D-12 Installs control systems 37%	D-12.01 Places control system components	D-12.02 Connects control systems	D-12.03 Retrofits control systems

E – Performs commissioning

17%

Task E-13 Commissions new and retrofitted HVAC/R and control system components 54%	E-13.01 Performs pre-start-up checks for HVAC/R systems	E-13.02 Performs start-up of HVAC/R systems	E-13.03 Performs start-up checks for control systems
	E-13.04 Completes HVAC/R system charge	E-13.05 Sets up primary and secondary HVAC/R system components	
Task E-14 Verifies system performance 46%	E-14.01 Verifies/sets operating parameters	E-14.02 Verifies system integration	E-14.03 Performs system optimization
	E-14.04 Completes commissioning documentation		

F – Performs maintenance and service

25%

Task F-15 Maintains HVAC/R systems 30%	F-15.01 Inspects HVAC/R systems	F-15.02 Performs predictive and scheduled maintenance on HVAC/R systems	F-15.03 Tests HVAC/R system components and accessories
	F-15.04 Optimizes integrated system performance		
Task F-16 Services HVAC/R systems 43%	F-16.01 Troubleshoots HVAC/R systems	F-16.02 Repairs HVAC/R systems	
Task F-17 Maintains and services control systems 27%	F-17.01 Performs maintenance and inspection on control systems	F-17.02 Troubleshoots control systems	F-17.03 Calibrates operating and safety controls
	F-17.04 Repairs control systems		